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Buyers Rather More Hesitant

Standard Oil Company Purchases of Tin Plates—More Vessel Building

Buyers of iron and steel are more hesitant in view of late developments. The Government crop report for August 1, with due allowance for some betterment since it was made up, points to continued conservatism in railroad purchases; and while the iron market and the securities market are often at variance, the recent course of the latter has made consumers cautious. It is to be said, on the other hand, that for a good many months the steel mills have been sending their products directly into consumption. That so great a scale of operations has been supported almost entirely on wear and tear demand is no mean argument against any important recession.

The conclusion has been hastily drawn in some quarters that the Steel Corporation's ingot production, now about 77 per cent. of capacity, is a gauge of the entire industry. Counting 15 per cent. of the Corporation's product as exports would give a 66 per cent. operation for the home trade, and that is probably close to the present average of the independent steel companies, whose exports are almost negligible.

On the whole, prices of finished products are not weaker, but in bars alone are they firmer. The situation is one in which deeper cuts might come if there were any good contracting for extended delivery. As long as consumers buy sparingly they will keep price changes within narrow limits.

There are better reports of rail and car buying. The Oregon Short Line has taken 20,400 tons, the Wichita Falls Railroad, 10,000 tons, and the Wabash 2,500 tons—all Bessemer rails, to be rolled in the Chicago district. Japan has placed 4,200 tons of rails in this country and Argentina is out for a large lot. The Erie Railroad has divided 4,000 freight cars among three companies and is to close this week for 60 locomotives. The Frisco System has bought 1,200 cars.

The prospect of considerable vessel building, even though some of it is not immediate, has encouraged the plate trade. The American-Hawaiian Steamship Company plans to build four steamers of the 10,000-ton class. Of the five new Government colliers steel contracts have been let for three. For two of these 6000 tons of shapes have gone to a Pittsburgh mill, while Eastern mills have taken 20,000 tons of plates.

Structural orders have come chiefly from the East and Central West. The American Bridge Company was low bidder on the Point bridge at Pittsburgh—6,000 to 7,000 tons—while the steel for the Kansas City terminal station, 14,000 tons, lies between two large companies. For the proposed municipal convention hall at Philadelphia 6500 tons of steel will be needed. The leading interest will fabricate the steel for the Northwestern Life Insurance Company building, Milwaukee, 5300 tons.

In the sheet trade nominal prices are still cut

$1 to $2 a ton. Shading of the $3.70 base price, Pittsburgh, for tin plates is both affirmed and denied. The Standard Oil Company has recently contracted in this country for tin plates for the remainder of the year. At the same time it has placed a part of its re-export requirements with Welsh mills. The latter have quoted lower prices than at the beginning of the year, when the Standard Company's order went entirely to American mills.

Sales of foundry pig iron have increased, but Southern furnaces have not been successful in their efforts to establish a $10.50 Birmingham basis for the last quarter. Sales have been made at $10.25 for delivery through this year and $10 iron for prompt shipment is still available, while two or three sales of round lots are reported at that figure for delivery extending into the fourth quarter.

In Eastern Pennsylvania 10,000 to 12,000 tons of basic iron has been bought for this year at $14.75 to $14.90 delivered. A Pittsburgh steel company has bought 5000 to 6000 tons of basic for the remainder of the year at a little below $13 at Valley furnace. Pittsburgh reports an inquiry for a large amount of Bessemer iron.

After a long wait, the Lake iron ore market has developed some activity, recent sales amounting to 100,000 tons. Swedish ores are now quoted at 8 cents per unit alongside Delaware River dock.

British and American Blast Furnace Activity

A sharp contrast is furnished in the conditions of pig iron production in Great Britain and the United States. British blast furnaces are very much better employed than those of the United States. In 1910 both countries broke all previous records in the production of pig iron, but in Great Britain the achievement was one of note, while in the United States there was disappointment that the record was broken by so small a margin. In the United States from 1897 to 1907, both years being record years in their time, production increased 267.1 per cent., which was an average gain, each year over the preceding, of 10.3 per cent. The 1910 production, however, was a gain of only 6 per cent. over that of 1909, and of practically the same percentage over 1907. If production had continued to increase year by year after 1907 at the same rate as from 1897 to 1907 the 1910 production would have been 34,600,000 tons instead of 27,390,000 tons. While the gain made in 1910 may be considered fairly satisfactory at long range, it was quite unsatisfactory compared with the experience of the ten years 1897 to 1907, a period of unusually rapid expansion.

In Great Britain, on the other hand, the gains in a long period of years have been only occasional. In the past 40 years there have been only 11 years in which all previous records were broken, and from 1897 to 1907 the gain was only trifling. The earlier year made a new record, which was broken in 1899, while the 1899 record was not broken until 1905. One year later the 1905 record was broken, but that of 1906 was not broken until 1910.

Thus the year 1910 was a good year in the blast furnace industry, and we find from statistics collected by the Iron and Coal Trades Review that the average number of furnaces in blast in the year was 335. In the first quarter of this year the average number in blast was 333, according to the same authority, while in the second quarter the average was 318, making a general average for the first half of this year of 325 furnaces. The June quarter, with 505 furnaces and 318 in blast, showed a proportion of 63 per cent. in operation. In the United States the proportion has been much smaller. From the midsummer presentation of the American Iron and Steel Association we derive the following comparison:

	Total number.	In blast June 30.	Percentage in blast.
Bituminous coal and coke.....	385	199	51
Anthracite and mixed.....	38	6	16
Charcoal	49	16	33
All furnaces	472	212	45

Thus we have 45 per cent. of the American blast furnaces in blast on June 30, against 67 per cent. of the British furnaces in blast during the June quarter. One is accustomed to think of our charcoal and anthracite furnaces pulling down the average, so it may be observed that, excluding them entirely, the percentage of bituminous coal and coke furnaces active was only 51, which still makes an unfavorable comparison with the British furnaces.

We have commonly thought of the evolution of the blast furnace from the primitive to the modern being slow in Great Britain and rapid in the United States, but as a matter of fact the progression on the blast furnace is not uniform throughout the American industry. While some producing interests are continually rebuilding their furnaces, others are not. The race of furnaces with iron pipe stoves is not extinct, although nearly so; but not many years ago a relatively large number were producing pig iron alongside of modern automatically filled furnaces. It is possible that the very slowness of expansion in the British industry has made it that the distance is smaller from the most primitive to the most modern furnaces. In the United States there is a great distance.

It would be difficult to estimate what proportion of the total number of furnaces would be found active in the two countries, in times which would be regarded as really good; but a large part of that difficulty is due to the fact that the concept of good times is different in the two countries. In England times are considered good when profits per ton of pig iron are moderate according to the American idea, which in recent years has been that "good times" means the employment of practically all the listed furnaces. When the least fit are running at their cost line, however, the best positioned furnaces are making several dollars a ton profit.

A Latent Service of Scientific Management

Labor problems and scientific management are interdependent and it is to skillful scientific management that many look for the solution of the labor question. Industry has of late become so involved in a sociological way that readjustment of wages has become more difficult than ever. The well being of a class of workers as a whole has gradually been accepted as of paramount importance. At the same time public opinion, in developing a greater expression of the paternal spirit of government, is probably making scientific management more difficult to introduce even though it takes firm root when once properly understood.

More general elimination of Sunday working, talked of and tried, is a good instance of the close linking of society and business; but the real problem—of giving the worker the income to which he is ad-

justed and of maintaining for the employer the unit production on which his business can be kept competitive—has not had much public solution. The boon of scientific management, providing it meets this great problem, is immeasurable. We realize the latent danger to the whole fabric of business in even the one item of wage readjustment, and while the present tendency of compromise and delay, avoiding the real issue, may seem weak and likely to aggravate the violence of the final eruption, this very dalliance is undoubtedly giving scientific management its chance.

The Statistics of Blast Furnace Flux

Beginning with 1897 the American Iron and Steel Association has gathered statistics of the amount of limestone consumed in making pig iron. These statistics have usually attracted little attention, but, believing that a presentation of the data for the entire period would be of some interest, we have compiled the table below. It shows, first, the average number of pounds of limestone reported used per ton of pig iron made, for all grades of pig iron, and, second, the average quantity reported used by the coke and anthracite furnaces, excluding the charcoal furnaces. The consumption of the latter is very light, being in 1910 369 lb. and in 1909 382.8 lb. per ton of pig iron made. It is impossible to determine how accurate the returns are, for it is quite likely that at some furnaces exact figures are not kept from day to day, and also that some furnaces arrive at an approximate total of the year's consumption of limestone by some other method than that of adding the quantities ascertained as the furnace is charged. However reached, the figures are presumably not far from the precise truth.

Average Limestone Consumed in Making Pig Iron—Pounds of Limestone per Ton of Pig Iron.

	Coke and anthracite.	All fuels.
1897	1,002.3	985.7
1898	1,020.4	1,003.7
1899	(no data)	1,103.1
1900	1,222.9	1,205.6
1901	1,202.7	1,186.5
1902	1,207.7	1,192.8
1903	1,207.3	1,193.0
1904	1,128.0	1,112.6
1905	1,144.2	1,132.7
1906	1,192.8	1,178.8
1907	1,247.8	1,233.2
1908	1,229.4	1,217.1
1909	1,190.5	1,178.7
1910	1,204.0	1,191.8

On the whole, the figures for 14 years show a negative result. So much has been said about the decreasing average iron content of the ores used from year to year that the first thing one is prompted to look for in such a presentation is statistical evidence of a progressive increase in the amount of flux required as the average of impurities in ore used increased. This we do not find. It is true that for 1897 and 1898 the average limestone consumption was only a trifle over 1000 lb. per ton of coke and anthracite iron produced, while in later years the average has been fully 1200 lb. or 20 per cent. more, but from 1900 to 1910 we do not see any progressive increase. The average of 1900-1-2, indeed, is 1211 lb., while the average of 1908-9-10 is 1208 lb., or 3 lb. less.

The amount of limestone required does not, of course, depend solely upon the character of the iron ore, but depends also to an extent upon the coke. If there had been a progressive change during the period in the kind of coke used, we might look to this as tending to conceal other forces believed to have been at work, but there has been no change such as can be claimed clearly to have had a bearing.

The changes from year to year do seem to follow one principle with considerable fidelity, and that is that the limestone consumption appears to go up in good times, when there is heavy production with hign prices, and to go down when conditions are reversed. In this we may perhaps discern a tendency to use leaner ores when profits are large, and to drive furnaces harder at the same time, both of which trends would serve somewhat to increase the average limestone consumption. It may be that the more rapid increase in the production of Northern iron, as compared with Southern, has tended to rearrange the average, but this influence would not be very important, particularly as there are partly self-fluxing ores in the South. The general showing is that the coke and anthracite furnaces of the country report that they are using 0.54 to 0.55 ton of limestone per ton of pig iron produced.

Safety Devices for Grinding Wheels

A common form of failure to guard against accidents to employees is in the use of grinding machinery. The manufacturers of abrasive wheels and of machines for their use have given the subject a great deal of specialized attention, and as a result safety devices have been developed which must reduce the risk practically to a minimum. The great danger, of course, lies in wheel explosions due to excessive speeds. All abrasive wheels are tested before they leave the factory, where they are run at speeds which give a wide margin of safety over correct commercial practice. If an explosion follows in the shop of a customer, the presumption is that the fault lies in usage rather than in manufacture.

A common error is to place too large a wheel on a spindle without reducing the revolutions per minute. Peripheral speeds multiply rapidly with increased diameters, and the wheel, getting beyond its breaking point, goes to pieces, causing, perhaps, the death or serious injury of workmen. Many grinding machines are equipped with guards, the removal of which is necessary before too large a wheel can be substituted. The user is provided with other means with which to secure immunity from accident, if he is willing to accept them. But he must follow up the use of the devices in his works in order that careless or ignorant employees may not throw them aside. With large wheels special safeguards are furnished to keep the revolving mass under control. With certain types a heavy steel band encircles the disk, to assist in withstanding the strains of centrifugal energy. In many works, especially in small establishments, wheels are to be seen mounted on spindles running at speeds far too great for the diameters.

With the coming in of liability laws compelling the payment of damages for injuries to workmen regardless of liability, employers should look carefully into menaces such as these. Owners of small works complain that under the new statutes crippling financial injury may be done them, because the increased ratio of overhead burden due to accidents may be too great for them to endure. If such a condition has been created it behooves the employer to use every effort to reduce the chance of accident, and many ways are open to him in proceeding to that end.

The Steel Corporation's Unfilled Orders

The unfilled tonnage of the United States Steel Corporation on July 31 was 3,584,085 tons, an increase of 223,027 tons over the total on June 30, which in turn was 247,871 tons greater than that for May 31. The following table gives the unfilled tonnage of the Steel Corporation by months since June 30, 1910, together with tonnage at close of each quarter from December 31, 1902, to June 30, 1910:

July 31, 1911	3,584,085	Mar. 31, 1908	3,765,343
June 30, 1911	3,361,058	Dec. 31, 1907	4,624,552
May 31, 1911	3,113,187	Sept. 30, 1907	6,425,008
April 30, 1911	3,218,704	June 30, 1907	7,603,878
Mar. 31, 1911	3,447,301	Mar. 31, 1907	8,043,858
Feb. 28, 1911	3,400,543	Dec. 31, 1906	8,489,719
Jan. 31, 1911	3,110,919	Sept. 30, 1906	7,936,884
Dec. 31, 1910	2,674,757	June 30, 1906	6,809,850
Nov. 30, 1910	2,760,413	Mar. 31, 1906	7,018,712
Oct. 31, 1910	2,871,949	Dec. 31, 1905	7,605,086
Sept. 30, 1910	3,158,106	Sept. 30, 1905	5,865,377
Aug. 31, 1910	3,537,128	June 30, 1905	4,829,655
July 31, 1910	3,970,931	Mar. 31, 1905	5,579,560
June 30, 1910	4,257,794	Dec. 31, 1904	4,696,203
Mar. 31, 1910	5,402,514	Sept. 30, 1904	3,027,436
Dec. 31, 1909	5,927,031	June 30, 1904	3,192,277
Sept. 30, 1909	4,796,833	Mar. 31, 1904	4,136,961
June 30, 1909	4,057,939	Dec. 31, 1903	3,215,123
Mar. 31, 1909	3,542,595	Sept. 30, 1903	3,278,742
Dec. 31, 1908	3,603,527	June 30, 1903	4,666,578
Sept. 30, 1908	3,421,977	Mar. 31, 1903	5,410,719
June 30, 1908	3,313,876	Dec. 31, 1902	5,347,523

About September 1 the new and enlarged plant of the Orenstein-Arthur Koppel Company, of Pittsburgh, will be put in operation. It is located at Koppel, Pa., on the Pittsburgh & Lake Erie and the Pittsburgh, Fort Wayne & Chicago railroads, and was built by the Nicola Company, of Pittsburgh. It gives about double the former capacity of the Orenstein-Arthur Koppel Company, enabling it fully to take care of the demand for its industrial cars, portable track and other railroad equipment. The new shop will also put the company in position to handle to better advantage orders for specially designed steel cars.

Combination coal and oil firing of boilers is practised in the Westport station of the Consolidated Gas, Electric Light & Power Company, Baltimore. The installation was described in a recent paper by H. A. Wagner, read before the National Electric Light Association. The space under the boiler, back of the usual coal grate, is made into a large combustion chamber with the oil burners at the extreme rear end. This combustion chamber is separated from the boiler tubes above by tiling and from the coal grate by a low bridge wall. It has been found that 2000 kw. of station load can be carried by each boiler when using coal and oil together with as much ease and certainty as 1200 kw. per boiler can be carried by coal alone.

On August 1 the entire six Duquesne furnaces of the Carnegie Steel Company at Duquesne, Pa., were in blast, but since that date No. 2 has been blown out for relining. At present the Carnegie Steel Company is operating 42 of its 59 blast furnaces in the Pittsburgh, the Wheeling and the two Valley districts. In the Pittsburgh district on August 1 seven Carrie stacks were in blast, two out of three Clairton furnaces, seven out of eleven Edgar Thomson furnaces and the two Lucy furnaces. Edith furnace, the three Isabella stacks and Neville Island have been out of blast for a long time.

The Anglo-California Trust Company, San Francisco, Cal., has been named as trustee of an issue of $1,200,000 first mortgage bonds authorized by the directors of the Pacific Coast Steel Company, San Francisco, with which concerns at Portland and Seattle were recently consolidated.

The Ontario Exploration Company has decided to close its iron mines at Wilbur, north of Kingston, Ont., for a time. President Hanna, of Cleveland, Ohio, who recently visited Kingston, said there was no market for iron ore in the United States. The company has had 140 men at work at Wilbur. It has not made any shipments as yet.

The Brightman Mfg. Company announces that its new plant at Columbus, Ohio, is now completed and in operation. It is especially equipped for the manufacture of shafting and the company's line of straightening and shafting machinery.

Industrial Legislation in Pennsylvania

HARRISBURG, PA., August 14, 1911—State commissions to investigate the causes of industrial accidents and the methods of building construction in Pennsylvania are to be named by Governor Tener in September with a view to drafting legislation to be presented to the general assembly of 1913. The administration has taken up the subject of employers' liability and a study of laws of other states will be made in conjunction with the investigation into accidents. The commissions will be composed of seven men each, most of the members to be legislators, and ample funds will be provided for experts and for inspections in industrial centers. Particular attention is to be given to conditions in iron and steel plants and to railroad operation.

The legislative commission to study the taxation system and recommend new laws for corporate taxation will resume its sittings this fall. Its report is to be made in January, 1913.

Many Electric Power Charters in Pennsylvania.—Over 200 charters for electric companies have been granted by the State of Pennsylvania since May 1, this year, and considerable significance is attached to the fact that the groups into which they were divided embrace coal and water power centers. The companies were chartered with nominal capital and each one was given a district in which to supply electricity for light, heat or power, the ultimate plan being to consolidate. The large coal companies of the anthracite region are behind some of the charters, New York capital being interested in a group chartered for the Lehigh Valley. In the soft coal region groups have been secured for townships in the vicinity of Johnstown, Pittsburgh, Washington and Uniontown. Fourteen were taken by interests which will use Susquehanna river power and charters for nineteen are pending for a group to operate in the Clarion river valley.

A good performance with stokers for steam boilers is reported from Amoskeag Mills, Manchester, N. H. The refuse from four boiler rooms, one with hand-fired boilers and three with boilers equipped with the Jones stoker, was analyzed. Deductions made by Capt. Chas. H. Manning, consulting engineer of the Amoskeag Mfg. Company, were that the refuse from the Jones stoker was found to contain 15.73 per cent. combustible, while the refuse from the hand-fired boilers amounted to 42.78 per cent. combustible. The mills burn 120,000 tons of coal each year at a cost of $4.50 per ton. It is felt that this showing justifies the statement that the stokers are saving the mills $11,143.11 each year in reduced combustible in the refuse. Capt. Manning is quoted to the effect that not only is there less waste fuel, but better results are obtained from the portions utilized. The boilers are the Manning fire tube type, designed by Capt. Manning.

The Pitt Construction Company, Pittsburgh, will build a 300,000-gallon water filtration plant, half-million gallon reinforced concrete covered reservoir, settling basin and appurtenances for water works for the State Asylum for Chronic Insane at Wernersville, Pa. Plans and specifications were drawn by Shester & Fleming, Union Bank Building, Pittsburgh.

The members of the International Association of Machinists have been holding an election by letter ballot for several weeks past and the count has now been completed. James O'Connell has been unseated as president and W. H. Johnson, Providence, R. I., has been elected in his place. Walter Ames, Boston, who was vice-president of the association, was also defeated for re-election.

Thomas Carlin's Sons Company, Oliver Building, Pittsburgh, has shipped an 8-ft. automatic wet-grinding pan, with base for motor drive, to the Pennsylvania Steel Company, Steelton, Pa., and is finishing tank and other work for a Pittsburgh asphalt plant.

The new Morgan rod mill of the Jones & Laughlin Steel Company at Aliquippa, Pa., is nearly completed and will be put in operation in the near future.

Personal

F. B. DeGress has resigned the position he has held for more than ten years as New York district manager of the Crocker-Wheeler Company to become general sales manager for the Pulsometer Company, 17 Battery place, New York City. In addition to looking after the sales department he is also carrying on a series of experiments with a view to improving certain features of the pulsometer and making it suitable for general pumping work in power plants and industrial establishments.

Wm. Paul Gerhard, author and consulting engineer for hydraulic and sanitary works, New York City, has been given the honorary degree of doctor of engineering by the Technical University of Darmstadt, Germany.

G. Walter Bates, of Matlack & Bates, pig iron and coke merchants, Philadelphia, sailed August 12 for a month's trip abroad.

H. C. Frick has resigned in the past week as a director of the Union Pacific Railroad. The report was current that he would resign also from the directorate and the Executive Committee of the United States Steel Corporation, but this he has denied.

James W. Fagans, who has been for the past year superintendent of the plant of Abendroth Brothers, Port Chester, N. Y., has just been appointed general manager. Previous to going to Port Chester he was connected with the Detroit Stove Works for thirteen years.

Frank A. Moeschel, sales manager of the Newport Rolling Mills Company, Newport, Ky., has returned from a vacation trip to Canada.

Ashley P. Peck, for six years identified with Allis-Chalmers Company as sales engineer, connected with its New York office, recently associated himself with the Terry Steam Turbine Company as district sales manager for the Middle West, with offices at 814 People's Gas Building, Chicago, Ill. Prior to 1902 he was actively connected with the machinery sales field of Chicago, and since that date, for three years, was manager of the Milwaukee district sales office of the National Electric Company, going from Milwaukee to the Allis-Chalmers Company at New York in 1905. He is a graduate of Purdue University and is an associate member of the American Institute of Electrical Engineers.

William Vaughan, chemist, of Arthur D. Little, Inc., Boston, has been detailed from that organization as an assistant in the new centralized testing department which has just been organized under its direction for the General Motors Company, Detroit, Mich. Mr. Vaughan was chemist for the Salem Iron Company, Leetonia, Ohio, and Union Iron & Steel Company.

T. J. Drummond, of Drummond, McCall & Co., Montreal, and president of the Lake Superior Iron Corporation, who attended the congress of steel manufacturers in Brussels, has returned. While abroad he completed financial arrangements for the extension of the Algoma Central and the Algoma Eastern lines, which are controlled by the Lake Superior Corporation.

John C. Searight, superintendent of blast furnaces for the Republic Iron & Steel Company in the Northern district, with headquarters at Youngstown, Ohio, has resigned. His successor has not yet been appointed.

Arthur T. Herr has been appointed western representative of the Inter-Ocean Steel Company, Chicago, with headquarters at 412 First National Bank Building, Denver, Colo.

E. E. Protherow has joined the staff of the Gregory Electric Company, Chicago, and will represent the company in the sale of its motors in Chicago and adjacent territory. He was for six years connected with the Chicago office of the Crocker-Wheeler Company. R. D. May is also a new member of the selling force of the Gregory Electric Company. He was for a number of years with H. M. Byllesby & Co.

Robert E. Brooke, general manager E. & G. Brooke Iron Company, Birdsboro, Pa.; Edgar S. Cook, president Warwick Iron & Steel Company, Pottstown, Pa., and Albert Broden, manager Temple Iron Company, Reading, Pa., sailed August 8 for a short trip abroad. Mr. Brooke and Mr. Cook will return early in September, while Mr. Broden expects to make a more extended visit.

C. H. Elliott, formerly superintendent of the Atlanta Steel Company, Atlanta, Ga., has been appointed superintendent of the new open-hearth steel plant to be built by the Youngstown Sheet & Tube Company, Youngstown, Ohio. He will supervise the erection of the six new furnaces to be built, plans for which are now being prepared in the company's engineering department, to be passed upon by Julian Kennedy, consulting engineer.

W. D. Creider has resigned as superintendent of the plant of the Pressed Radiator Company of America at West Pittsburgh, Pa., to become superintendent of the works of the Duff Mfg. Company.

Obituary

CHARLES KOEGEL, Springfield, Mass., senior member of the firm of Charles Koegel & Son, manufacturers of paper mill machinery, died August 9. Born in Germany and educated at Heidelberg University, he came to the United States as a young man and entered the paper manufacturing industry. He invented various improvements in paper-making machinery and in 1892 established the business which bears his name. He leaves a widow and three sons.

Western Steel Corporation Bond Issue.—It is announced that stockholders of the Western Steel Corporation, Seattle, Wash., have approved the recommendation by the directors of an issue of $5,000,000 bonds to provide new operating capital. It is stated that the company's president, James A. Moore, has arranged for placing this issue in the East. Work was resumed at the company's steel plant at Irondale, Wash., early in August and it is stated that the rolling mill will be run steadily for some time. The open-hearth department is in operation and a third furnace is being prepared for starting. The blast furnace at Irondale has not been in operation this year.

Back Number Wanted.—The Circulation Department of *The Iron Age* desires a copy of No. 15, Volume 81. If one of our readers can spare this copy of the paper we would be glad to have him notify us, addressing the department above named.

The Cambria Steel Company, Johnstown, Pa., which heretofore has built only steel cars, announces that it will engage in the manufacture of wooden box cars and passenger cars. It is now prepared to quote prices on wooden box cars, and in the spring will quote prices on passenger cars. It will install the necessary new equipment at once, contracts for the most of which have already been placed.

The Republic Iron & Steel Company's offices, formerly located in the Oliver Building, Pittsburgh, have been removed to the new office building erected by the company at Youngstown, Ohio. A district sales office will be maintained in the Oliver Building, in charge of George L. Claypool, whose title will be district sales manager, in charge of sales in the Pittsburgh district.

James Rees & Son, Pittsburgh, have received a contract for the building of 14 small steel boats for use on the Amazon River, South America. Each of the boats will be about 125 ft. long, and will carry about 200 tons of freight. The steel will be furnished by the Carnegie Steel Company.

The Pittsburgh & Conneaut Dock Company has established a record in ore unloading at its Superior dock, Ashtabula, Ohio, which is equipped with four 15-ton Hulett electric unloaders. These four machines took 10,234 gross tons of ore out of the steamer Thomas Lynch August 10 in 4 hours and 6 minutes. The unloading began at 6:30 a. m. and was concluded at 10:36 a. m. The average per hour per machine was 637.6 tons. The average tons per hour, start to finish, by the four machines was 2550.5.

The Duff Mfg. Company, N. S., Pittsburgh, has received a large contract for hydraulic jacks and Barrett geared ratchet jacks within the past week from the Brazilian Government Railways in Brazil. These jacks comprise various sizes for car and locomotive equipment, with special traversing bases whereby the cars or locomotives may be moved sidewise after having been raised. They run from 25 to 40 tons capacity.

The Iron and Metal Markets

Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 16, 1911.	Aug. 9, 1911.	July 19, 1911.	Aug. 17, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace.	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	13.50	13.50	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.25	10.25	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	15.00	16.50
Basic, delivered, eastern Pa.	**14.75**	14.50	14.25	15.00
Basic, Valley furnace	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh	15.90	15.90	15.90	16.15
Gray forge, Pittsburgh	13.90	13.90	13.90	14.25
Lake Superior charcoal, Chicago.	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	**1.50**	1.40	1.40	1.55
Furnace coke, future delivery.	1.65	1.65	1.55	1.75
Foundry coke, prompt shipment.	1.85	1.85	1.80	2.15
Foundry coke, future delivery.	2.10	2.10	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.00
Iron rails, Philadelphia	17.50	17.50	17.50	18.00
Car wheels, Chicago	12.75	12.75	12.50	14.50
Car wheels, Philadelphia	13.00	13.00	13.00	14.00
Heavy steel scrap, Pittsburgh	13.25	13.25	13.00	14.25
Heavy steel scrap, Chicago	10.75	10.75	10.50	12.25
Heavy steel scrap, Philadelphia.	13.50	13.50	13.25	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill.	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia.	1.27½	1.27½	1.27½	1.42½
Common iron bars, Pittsburgh.	1.25	1.25	1.25	1.45
Common iron bars, Chicago.	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.20	1.20	1.25	1.40
Steel bars, tidewater, New York	1.36	1.36	1.41	1.56
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York.	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York.	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound.	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.20
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	13.00
Electrolytic Copper, New York.	12.62½	12.62½	12.55	12.62½
Spelter, St. Louis	**5.95**	5.80	5.57½	5.05
Spelter, New York	**6.15**	6.00	5.75	5.20
Lead, St. Louis	4.45	4.45	4.40	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	**44.00**	43.00	42.00	33.85
Antimony, Hallett, New York.	7.75	7.75	8.00	7.95
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 to 14, 1.60c.; Nos. 15 and 16, 1.70c., one pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge	Painted.	Galvanized.	Gauge	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
1 to 1¼ in.	..	..	49	43
⅜ in.	75	63	71	59
½ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69

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Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2¼ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in.....Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., August 16, 1911.—*(By Telephone.)*

Pig Iron.—The pig iron market is distinctly better as regards inquiries and sales, but low prices are still ruling. Consumers believe it is a good time to cover ahead at present prices and several large purchases have been made. The Colonial Steel Company has bought 5000 to 6000 tons of basic iron from a Valley furnace for delivery over the remainder of this year at a price slightly under $13 at furnace. The Standard Sanitary Mfg. Company has inquiries out for about 3000 tons of Northern No. 2 foundry iron for its North Side and New Brighton, Pa., plants, but may buy more if the prices made are attractive. A large inquiry is reported in the market for Bessemer iron. The Carnegie Steel Company has blown in one of its three Isabella furnacs and one more Edgar Thomson furnace and is now operating 44 of its 59 blast furnaces, the largest number it has had in blast for more than a year. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—In the first half of August, actual orders sent to the mills for rolling by the billet and rail sales departments of the Carnegie Steel Company showed a gain of over 37,000 tons over the same period in July and the gain for the second half of August will be still larger. The Homestead, Clairton, Duquesne, Mingo Junction, Bellaire and New Castle steel works of the Carnegie Company are this week running at 100 per cent. of capacity, for the first time in over a year and a half. This company is now operating 82 per cent. of its total ingot capacity. We note a sale of 500 tons of 4 x 4 in. open hearth billets at $21, Pittsburgh, and a sale of 300 tons of forging billets at $26, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Structural Material.—The Carnegie Steel Company has received a contract for about 6000 tons of shapes for two Government colliers to be built by the Newport News Shipbuilding & Dry Dock Company, and will also get a contract for a similar tonnage of shapes for two more colliers to be built by the Maryland Steel Company. The plates for these four boats, upward of 20,000 tons, will be furnished by Eastern mills. In the first half of August orders of the structural and plate departments of the Carnegie Steel Company showed a gain of 12,000 tons over those for the first half of July.

(By Mail.)

The steel mills are not only maintaining the improved rate of operations noted for several weeks but are increasing it. This week the Cambria Steel Company is operating all of its eight blast furnaces and its 25 open hearth furnaces. The Republic Iron & Steel Company is running practically full in its Bessemer and open hearth steel works and its finishing mills. The Carnegie Steel Company is operating this week to nearly 80 per cent. of ingot capacity, the highest rate for some months. The Jones & Laughlin Steel Company is operating its five Eliza blast furnaces, its American Iron & Steel Works on the South Side to about full capacity, and may start this month two of its blast furnaces and several of its Talbot open hearth furnaces at Aliquippa, Pa. Its Soho furnace is out for relining. The larger steel mills report that new orders and specifications against contracts are heavier than for months. Specifications against contracts for billets and sheet bars are better, and the mills will ship out more steel this month than in July. While on some lines prices of finished iron and steel are none too strong, the tone of the market is firmer. Consumers of scrap are willing to buy ahead at to-day's prices, but dealers are inclined to hold, believing that prices will be better in the near future. The market on strictly standard Connellsville coke is firmer at $1.50 per net ton at oven for spot.

Ferromanganese.—Reports as to prices for delivery next year are conflicting. It is stated that some sellers are willing to take contracts for first half at $37, Baltimore, and that some tonnage has been sold at this price. Others will not consider this price, but are holding for first half at $37.50 to $38, Baltimore. A Sharon consumer is in the market for 250 to 500 tons of 80 per cent. for first half, and the business is likely to be closed this week. Most consumers are covered over the remainder of this year. We quote 80 per cent. foreign ferro at $37, Baltimore, for remainder of this year delivery, and from $37.50 to $38 for first half of next year, the freight to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—While there is practically no new demand for ferrosilicon, prices are very firm and sellers are asking higher figures. On several small lots of 50 per cent. for early shipment as high as $53 to $54, Pittsburgh, has been quoted, and the market seems to be firm at these figures. We quote blast furnace ferrosilicon as follows: 10 per cent., $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—The stronger feeling in other lines of semifinished products is reflected in muck bar, prices on which are firmer. We quote best grades of muck bar, made from all pig iron, at about $29, Pittsburgh. There have been no recent sales.

Skelp.—New inquiry is light, but the mills that roll skelp for the open market have a fair amount of tonnage on their books. Prices seem to be a shade firmer. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—Mills report that specifications against contracts for wire rods are coming in a little better, but new inquiry is light. Very few rods are now sold in the open market, most consumers having their own sources of supply. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh.

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Steel Rails.—The Cambria Steel Company has received an order from the Southern Railway Company for 5000 tons of open hearth rails. The Carnegie Steel Company has taken several fair sized orders for standard sections in the past week, and it is said that some rather large inquiries are pending. This company received new orders and specifications in the past week for about 2500 tons of light rails. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—The market is more active. The Carnegie Steel Company reports that its orders for plates and shapes so far this month are about 12,000 tons ahead of the same period in July. Some large car orders have been booked and others are pending. The Erie Railroad has bought 1000 composite gondola cars from the Pressed Steel Car Company, 2000 from the Standard Steel Car Company and 1000 from the American Car & Foundry Company. The Missouri Pacific is in the market for steel underframe box cars, 2000 all-steel gondolas, 500 steel underframe stock cars, 400 automobile furniture cars and 500 steel underframe flat cars. The Pennsylvania Lines West are in the market for 700 gondolas, the Illinois Central for 1000 gondolas, the Wabash for 1000 steel underframe box cars, the Frisco system for 250 steel underframe cars, the Florida East Coast Line for 300 to 500 flat cars, 50 to 60 composite gondolas and equipment for 25 steel passenger cars, the Queen & Crescent is asking for 159 all-steel gondolas, 22 all-steel coke cars and 175 all-steel hopper cars, and the Atlantic Coast Line is asking prices on eight postal cars. The general demand for plates is better and the leading mills are slightly increasing their rate of operations. We continue to quote ¼-in. and heavier plates at 1.35c., Pittsburgh, but in some cases 1.30c. is being named on specially desirable orders on both narrow and wide sizes.

Structural Material.—Bids went in last week on the steel, 6000 to 7000 tons, for the new Point Bridge in this city. The contract has not been awarded, but will likely go to the American Bridge Company, the lowest bidder. Bids have also gone in on the addition to the First National Bank building in this city, about 2600 tons. These are the only large local jobs in the market. The American Bridge Company has taken about 1060 tons of steel for new buildings for the Westinghouse Electric & Mfg. Company at East Pittsburgh. New inquiries are fairly active and the outlook is good. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Sheets.—New orders and specifications on sheets in the past 10 days have been very heavy and shipments by the mills this month are certain to show a large increase over July. The unsatisfactory feature of the market is prices, there being a good deal of cutting going on in black, galvanized and roofing sheets. In most cases this does not exceed $1 a ton, but in some instances it has amounted to $2 a ton. The American Sheet & Tin Plate Company is operating this week to about 70 per cent. of its hot sheet mill capacity, and the independent mills are running at about the same rate. Regular prices on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—Little or no new business is being placed at present, but the mills report that specifications are coming in in good shape and shipments this month will show an increase over July. The American Sheet & Tin Plate Company is operating this week to 80 per cent. of its hot tin mill capacity, and this rate of operation promises to be maintained for several months. We quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Bars.—Most leading consumers of steel bars are now pretty well covered over the remainder of this year, and in some cases into the first half of next year, so that the actual amount of new business being placed is not as heavy as it was some time ago. Specifications against contracts are coming in freely and one or two mills report that they are from two to three weeks back in shipments. While prices are reported as being a shade firmer, it is still possible to place desirable orders for steel bars at 1.20c., Pittsburgh. The new demand for iron bars is only fair and is mostly in small lots to meet actual needs. Prices on iron bars are weak, and it is said that in some cases they are being sold below cost. We quote steel bars at 1.20c. to 1.25c., Pittsburgh. While iron bars are quoted at 1.25c. to 1.30c., Pittsburgh, these prices have been shaded.

Hoops and Bands.—There has been a considerable increase in new orders for both hoops and bands, while specifications against contracts are also coming in better. Recently there has been some slight shading in prices of hoops, but this has not exceeded about $1 a ton and is not general by any means. Shipments of hoops and bands this month promise to be heavier than in July. We quote steel hoops at 1.40c. and bands at 1.35c., extras on the latter as per the steel bar card.

Merchant Steel.—New orders and specifications so far this month are better than in July, one mill reporting nearly double the business entered so far this month as compared with last. Prices are reported firmer, but are still being shaded. Regular prices are as follows: Iron finished tire, ¼ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—New business is showing some betterment, and consumers are also specifying more freely against contracts. We continue to quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—New orders for wire and wire nails are still confined to small lots to cover actual needs. Jobbers and retailers are carrying as light stocks as possible, fearing that present prices may not be held. A heavier business in wire and nails is looked for when fall trade opens up. Prices on both wire and nails are still being shaded, in some cases about $1 per ton. Regular prices are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full weight added to point of delivery.

Spelter.—The market has shown a sharp advance in the past week. The new demand is heavier than for some time. We quote prime grades of Western at 6c., East St. Louis, equal to 6.12½c., Pittsburgh.

Iron and Steel Scrap.—Not a great deal of scrap is being sold at present by dealers to consumers for the reason that the dealers believe that prices will be higher in the near future, and they are disposed to hold their scrap and take chances on the market. The consumption of steel making scrap is heavier now than for some months, and it is stated that stocks held by most consumers are rather light. We note sales of 500 tons of cast iron borings at about $9.65 delivered at buyer's mill; 500 tons of machine shop turnings at $9.85 delivered and 1000 tons of heavy steel scrap at $13.25 delivered at buyer's mill in the Pittsburgh district. Dealers now quote as follows, per gross ton, f.o.b., Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery.	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13.25
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.50 to 9.65
*Machine shop turnings	9.75 to 9.85
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Merchant Pipe.—No large orders for gas or oil lines have been placed in the past week, but several good-sized inquiries are in the market. The new demand for merchant pipe keeps up remarkably well for the season, and shipments by the mills this month promise to be heavier than in July. It is stated that prices on iron and steel pipe are being well maintained, there being only occasional concessions. Regular discounts will be found on a previous page.

Boiler Tubes.—The market on boiler tubes does not

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show any betterment either in new demand or prices. The new demand is light and specifications on orders are only fair. Discounts continue to be materially shaded.

Coke.—Some betterment in the new demand for furnace coke is reported, but most consumers are covered by contracts. Several furnaces, however, are buying their coke from month to month, and claim they are saving money by doing it. There is not much new demand for foundry coke, most consumers being covered. The optput in the Upper and Lower Connellsville regions is now running close to 290,000 tons per week, a material gain over two or three weeks ago. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and for the remainder of the year $1.60 to $1.65 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.90 to $2 and on contract from $2.10 up to $2.25 per net ton at oven.

Chicago

CHICAGO, ILL., August 16, 1911.—*(By Telegraph.)*

Mill and steel making furnace operations in this district at the present time apparently do not exceed 60 per cent. of their rated capacity. The ingot production is frequently at a greater rate than that of finished material. The necessity for placing dependence upon orders received from day to day continues to cause an intermittent operation of the mills. Progress has not been so rapid in August as was hoped for during the July spurt. The leading interest reports sales of about 32,000 tons of rails during the week. Structural business, while active, was not heavy, and contracts for fabricated steel were less than 1000 tons in the aggregate. Figures are being invited for a 4000-ton building for Chicago. Concessions in sheets and steel bars are still common, despite some improvement in the size of orders. In the scrap market dealers and brokers are disposed to hold material except when they can sell at an advance over present prices but the demand is very light. The Southern pig iron situation continues firm, as regards the asking price of $10.50, Birmingham, for No. 2, but there are practically no sales on this basis. Inquiry, particularly for malleable, is still plentiful but buying has suffered a check.

Pig Iron.—Inquiry for malleable iron is quite general, but it is understood that malleable foundries are not receiving specifications against their contracts for castings at a very satisfactory rate, and it is apparent that inquiries are allowed to drag and become old without any purchases being made. This is despite the fact that the local situation as to prices is still weak and $14.50 f.o.b. furnace will be made. Melters are asking for quotations on first quarter iron, but aside from nominal quotations furnaces are declining to consider tonnage for this delivery. Current quotations are for last half delivery. In the South the furnace attitude is firm. One interest will take business at $10.25, Birmingham, but others ask $10.50 and are not anxious for business, while $11 is still another's minimum. The amount of iron being bought at these prices is small, and, judging from the rate at which the recently purchased $10 iron is being taken, higher-priced iron will not be immediately in demand. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke, No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent.	17.90
Jackson Co. and Kentucky silvery, 8 per cent.	18.90
Jackson Co. and Kentucky silvery, 10 per cent.	19.90

(By Mail.)

Rails and Track Supplies.—Sales of standard section rails the past week aggregated about 32,000 tons for this market, all of which, with the exception of 500 tons, was included in two orders, one for the Pacific coast and one for Texas shipment. Light rails, while selling at low prices and in small quantity, show a better sales record for the past month than for several months previous. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The lettings of contracts for fabricated material during the week as reported were exceedingly light, totaling only 721 tons. The American Bridge Company will furnish 233 tons for a template shop and crane runway for the Haskell & Barker Car Company, Michigan City; 200 tons for the city hospital, Minneapolis, and 123 tons for a viaduct at Moline, Ill., for the Tri-City Railway Company. Steel for the new machine shop of Williams, White & Co., Moline, Ill., 165 tons, will be fabricated by the Kenwood Bridge Company. The mill situation as regards structural shapes remains as it has been, with a fairly good booking of specifications for immediate operations. Few contracts in hand, however, extend beyond the first of the year. Future business has not been encouraged by the mills at current prices and no great inclination has been shown by buyers to anticipate the future. Prices for fabricated steel are firmer on the less attractive work, but there seems to be ample capacity remaining to take care of desirable tonnage at low prices. The movement of steel from store has been only fair. The price of plain material is being maintained with a considerable degree of regularity. We quote plain material for mill shipment at 1.53c. and from jobbers' stocks 1.75c., Chicago.

Plates.—Aside from a continuance of the tendency to permit slight concessions, the plate situation has not developed any matters of special significance. Specifications were somewhat freer, perhaps, but new business fails to show any material gains. We quote for Chicago delivery, mill shipment, 1.53c. and for store delivery 1.75c.

Sheets.—The slump in the volume of orders experienced in the latter part of July has been followed in August by some improvement. No response to this increase is indicated in the strength of prices. A weakness in the prices of sheet bars is credited with being the cause of recent concessions, opportunity being thus given to certain mills buying their bars to take business by making corresponding concessions in the finished material. Prices as much as $2 a ton below the nominal quotation are reported, but the general run of business indicates that it would be very difficult to obtain more than $1 a ton off. Out of store No. 28 galvanized sheets are now quoted at 3.45c. maximum, following a reduction of $2 a ton. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—The mill situation is reported to be improving, but it is stated that for fairly attractive specifications in carload lots 1.20c., Pittsburgh, can be obtained. On the contrary, it is equally true that in some quarters a strict adherence to the regular quotation of 1.25c. will be encountered. From a tonnage standpoint bar iron is hardly more active, but asking prices are distinctly firmer and for some business a price of 1.25c. would be within the range of the market. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Very encouraging crop reports from the South and the Pacific coast have brightened the tone of trade in wire products, although the movement is still at the dull midsummer rate. Wire mills are operating at but little over half capacity. Some interest is being displayed in goods for fall shipment for fencing and other manufactured articles, but barb wire and nails show little change. Jobbers' carload prices, which are quoted to manufacturing buyers, are

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as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast-Iron Pipe.—An award of 2000 tons of 48-in. pipe was made at Minneapolis last week to the United States Cast Iron Pipe & Foundry Company, which company also took 2000 tons of 8-in. at Portland, Ore. An additional 1800 tons was also placed by that city. A number of miscellaneous small orders are reported. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $25.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—While the market of the week was devoid of important transactions, it is apparent that stocks of scrap are being held more closely in the hope that the general business improvement will bring better prices. Current demand from melters is still very small and sales that are made do not show any higher prices. Inquiries for particular grades of scrap are likely to bring out quotations considerably above the market, particularly if the material is to be sold short. Certain inquiries for scrap of somewhat irregular grading are known to have gone begging on offers which would be attractive, based on the present market prices. We quote below for delivery to buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft	11.25 to 11.75
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.25
Heavy melting steel scrap	10.75 to 11.25
Frogs, switches and guards, cut apart	10.75 to 11.25
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	10.00 to 10.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., August 15, 1911.

A very fair volume of business has been transacted in both crude and finished materials. While buying has not been heavy in any one line, the aggregate has enabled producers, particularly in finished products, to hold their recent operative rate and in instances to make further slight gains. Less is heard of price concessions in finished materials. In pig iron a number of fair sized inquiries are under negotiation. Steel making irons show further movement, with basic at slightly higher prices. The pig iron situation continues to drift toward the seller's side. Negotiations for material for ship and car building are still under way, and some large business is expected to develop. The old material market drags, although prices in some grades show a slight advance, based largely on recent bids for railroad offerings.

Iron Ore.—Consumers are showing a little interest in the market and some would take on small lots of low priced ore if it were available. An air of expectancy regarding possible negotiations in Swedish ore for extended delivery is also noticeable. Importations for the week ended August 12 include 6466 tons of Swedish and 16,700 tons of Cuban ore.

Pig Iron.—The movement in foundry grades continues on an unchanged basis. The usual run of small orders, principally for near future delivery, continues to be placed at prices ranging from $15 to $15.25 for No. 2 X foundry, delivered in this vicinity. The bulk of the sales have been made at prices above $15, which some producers now name as a minimum for either No. 2 X, No. 2 plain or No. 3 foundry. A number of producers hold and obtain $15.25 as a minimum for standard No. 2 X, and even at that figure are not seeking business. Quite a few inquiries for lots of 500 to 1000 tons are before the trade from general foundries and soil pipe makers, several of which are expected to be closed this week. The cast iron pipe makers are still in the market for round lots of low grade iron; one Delaware River interest has closed for a part of its recent inquiry for 5000 tons, the only definite sale reported being a lot of 500 tons of No. 3 Southern foundry at $10, Birmingham. Virginia producers continue to report a fair volume of business in lots running from carloads up to 300 and 400 tons, for both early and remainder of the year delivery. Prices for Virginia foundry grades are unchanged at $12.25 to $12.50 at furnace for prompt and $12.50 for shipments extending over the remainder of the year. The productive rate in Virginia has decreased and promises to be further reduced by the blowing out of another furnace. Little is now heard of concessions for standard analysis Virginia foundry irons. The higher range of prices on Southern iron is practically prohibiting business in competition with Northern brands at the present range of quotations. The movement in forge iron has been light, only small sales of Northern forge for rolling mill purposes being reported at $14.25 to $14.50, delivered in this territory. Steel makers show more interest in the basic situation; a sale of about 6000 tons for fourth quarter shipment has been made at $14.75 to $14.90, delivered, while several thousand tons for prompt shipment, outside this immediate territory, were sold at a price equal to the market had the iron been delivered here. The inquiry for about 25,000 tons for the first quarter of 1912 reported last week is still before the trade; on this $15.50 delivered has been quoted, which is 50 cents above the buyer's idea, although the majority of sellers still refuse to name a price for shipment so far ahead. Sales aggregating about 1000 tons of low phosphorus iron are reported at prices ranging from $20 to $20.50, delivered. While there has been no general advance in prices of foundry grades, sellers are decidedly firmer in their views. The Eastern Pig Iron Association, which met in this city last week, reports orders for July as being somewhat larger than those in June; stocks on merchant furnace banks show a decline, while those of the steel works furnaces show a slight increase, the average, however, being slightly less than that for the previous month. The following range of prices is named for standard brands delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferromanganese.—Contradictory reports are current as to the firmness with which the recently named $37, Baltimore, basis for 80 per cent. is being held. Rumors that business has been done at $36.50 are heard. Very little inquiry, however, has developed in this territory and the market has not been seriously tested.

Billets.—Mills are operating largely on week to week orders, which are small individually, and then have little business booked ahead. Odd lot sales of misfit rolling and forging billets are reported at about $1 a ton under the market for standard billets. Occasionally inquiries for large lots of rolling billets come out but contracts develop slowly. Prices are firm at $23.40 for open-hearth rolling billets and $28.40 for ordinary forging billets, delivered in this vicinity.

Plates.—Eastern mills as a rule report operations at 70 per cent. of their capacity, which represents a gain of 10 per cent. over the previous week. While business is still largely confined to orders of a miscellaneous character, they are sufficient in number to enable makers to increase their productive rate. Considerable tonnage in the way of ship plates has been estimated on and car and structural plates are also being extensively figured on. Plate makers are decidedly encouraged with the outlook. Prices are being well maintained, 1.50c. delivered being held for the general run of ordinary business.

Structural Material.—While immediate business has not been particularly large, there has been a better distribution of orders and some of the smaller mills and fabricators have been getting a larger volume. Some of the more important fabricators are said to be seeking business less urgently. Several pretty fair structural propositions are in sight. The Municipal Convention

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Hall will require about 6500 tons, while the quantity required for the new Stock Exchange Building has not yet been figured. Considerable business in small bridge work has been coming from the railroads, but few are requiring over 100 to 200 tons. The Pennsylvania Railroad is said to have come in the market for an aggregate of 1000 tons of such bridge material during the month past. A little more firmness in fabricated prices is reported, while plain shapes are firmly held at 1.50c. delivered in this territory.

Sheets.—A fairly steady small lot demand is reported. Eastern mills continue to operate at full capacity and have not been affected by reported concessions on Western sheets. The bulk of the business is for early delivery, consumers showing little disposition to make contracts for extended shipment. Eastern makers' prices are unchanged.

Bars.—The demand has been very light, business placed being confined to small lots for prompt shipment. Refined iron bars appear to be pretty firmly held at 1.20c. Eastern mill, but there has not been enough attractive business to test the market. Steel bars have also been quiet; less disposition to shade 1.25c, Pittsburgh, is reported, although buyers claim to be still able to do 1.20c. on attractive orders. For delivery in this territory refined iron bars are quoted at 1.27½c. to 1.32½c., and steel bars 1.35c. to 1.40c.

Coke.—The demand is less active. A few small contracts have been made for foundry coke at unchanged prices, and considerable spot lot buying is reported. Less movement in furnace coke is noted, consumers confining their purchases largely to odd lots for early shipment. The recent range of prices still prevails, the following quotations, per net ton, being named for deliveries in this district:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.15 to 3.35
Foundry coke	3.75 to 4.20

Old Material.—The general market drags, both buyers and sellers awaiting developments. Material offered on the recent railroad lists went largely at slightly advanced prices, consumers bidding direct, getting the bulk of the offerings. Bids slightly over $13.50 failed to get railroad steel, and it is believed that $13.75 was nearer the price obtained. Better than $16 was bid for the railroad wrought scrap. Very little business is moving between consumers and brokers, and in few instances can any quantity of the leading grades of old material be had from dealers, who are holding for higher prices. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.50 to $14.00
No. 1 yard heavy melting steel scrap	13.00 to 13.50
Old steel rails, rerolling (nominal)	14.25 to 14.75
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.25 to 11.75
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, August 15, 1911.

Iron Ore.—After a long period of dullness the market is taking on a little life. Sales in small lots aggregating over 100,000 tons are reported during the week and some inquiries are still pending. Many furnace interests bought no ore early in the season and ore firms have been looking for some business during the latter part of the summer from consumers who will need a little to last them until the opening of the next shipping season. Scattered buying in small lots is therefore expected in the next few weeks, but it is not believed that the aggregate tonnage will be large. With a total movement of slightly over 14,000,000 tons to August 1 it appears unlikely that the season's shipments will exceed the estimate of 30,000,000 tons made early in the year, and it is very probable that the total will be slightly less than that. Ore companies are planning to shut down some of their mines earlier than usual this season. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market shows a little improvement in the demand for foundry grades in this territory, and local sellers are getting a better volume of inquiry from Eastern points. The largest local sale reported is 2000 tons of No. 2 Southern to the Best Foundry Company, Bedford, Ohio, for last quarter delivery. A central Ohio pipe manufacturers has bought 1500 tons for the remainder of the year, half Northern and half Southern. The leading sanitary interest is reported in the market for a large tonnage of Northern iron for its Pittsburgh plant and 1000 tons of Southern gray forge for its Louisville plant for the fourth quarter. Northern iron is fairly firm at $13.50, Cleveland and Valley furnace, for No. 2 for the last half delivery, although a local producer is understood to have shaded this price 25c. a ton on a large inquiry. While furnace interests generally feel that for the first quarter of 1911 they should get 25c. to 50c. a ton over current prices few care to make sales for delivery beyond January 1, and not many consumers show any desire to place contracts for the first quarter or half. Southern iron is firmer. Contracts are now being made on the basis of $10.50, Birmingham, for No. 2, which has become the ruling price for the last half, but for early shipment there is still Southern iron to be had at $10.25, Birmingham. For Cleveland delivery we quote as follows, delivered, for prompt shipment and for the last half:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry No. 2	14.60 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.55

Coke.—Some demand is being received for foundry grades in small lots. The only sale of any size reported is 2500 tons to an Eastern consumer for the remainder of the year. Foundries are nearly all covered with contracts and they are taking shipments fairly well. No sales of furnace coke are reported in this territory on which to base prices, but $1.50 to $1.55 per net ton at oven is now the general quotation for standard Connellsville grades for prompt shipment and $1.60 to $1.70 for the remainder of the year. We quote Connellsville 72-hr. foundry coke at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for the remainder of the year.

Finished Iron and Steel.—The volume of business is slightly better. While few orders of any great size are coming out consumers are ordering in somewhat larger lots than they have been recently, and the actual consumption of steel among manufacturing plants in this territory appears to be increasing. The steel bar market is firmer than it has been for several weeks. While desirable specifications and good sized lots for prompt shipment will doubtless still bring out a 1.20c., Pittsburgh, price for steel bars, the regular price of 1.25c. is now being more generally maintained for small lots and some mills are refusing to make any concession. Hard steel bars are being sold at 1.10c. at mill. We note the sale of about 500 tons of hard steel bars for reinforcing of two local buildings. The demand for structural material in small lots continues quite active and regular prices are being maintained. Some consumers seem to think that prices may go lower and are refusing to place contracts for future delivery. Bids will be received by the city of Cleveland August 17 for 800 tons of steel for rebuilding the Central viaduct. No building contracts requiring steel tonnage of any size are pending. The demand for sheets is moderate; regular prices are being generally shaded $1 a ton. Rivet prices remain about stationary; contracts are being taken for delivery until January 1 at 1.60c., Pittsburgh, for structural rivets and 1.70c. for boiler rivets. The demand for spikes shows an improvement, but prices are not firm. The demand for iron bars is more active. Both local rolling mills are now in operation, the Union mill having started up this week. We quote iron bars at 1.25c. to 1.30c., at mill.

Old Material.—The demand is more active and prices are firmer. One local steel plant that has not been buying scrap for some time is now in the market and is expected to contract for considerable tonnage. Another local steel plant has bought about 12,000 tons of scrap, mostly heavy steel, in the past few days and is now cov-

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ered for its requirements for about two months. While considerable heavy steel has been purchased at $12.50 in the past week very little can now be picked up at that price. Dealers generally are holding to a minimum quotation of $12.75. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.50 to $14.00
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.50 to 12.75
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.75 to 7.00
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.50 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, August 16, 1911.—*(By Telegraph.)*

Pig Iron.—Several Southern producers have advanced the asking price on No. 2 foundry to $11, Birmingham, for any delivery this year or for the first quarter of next year, but naturally they are not booking any business just now at this quotation. Southern market prices continue to show more signs of steadiness, and while $10 iron has not entirely disappeared it is only obtainable from a very few interests and strictly for prompt shipment. Quotable figures on Southern No. 2 foundry range from $10.25, Birmingham, for third quarter delivery to $10.50 for the last quarter, although $10.25 has lately been inserted in a number of contracts running to the end of the year. A St. Louis melter contracted on this basis for 1000 tons and several central and southern Ohio consumers also covered for medium sized tonnages. A central Ohio stove maker succeeded in getting 500 tons of Southern analysis iron at $10 at furnace for August-September shipment. The buying for strictly fourth quarter movement is mostly based on $10.50, Birmingham, and an Ohio manufacturer took on 2000 tons equally divided between Nos. 2 and 3 foundry at the price mentioned for the No. 2 grade. Consumers generally are contracting without sending out any inquiries, although there is one before the trade for 1500 tons of Northern foundry that is expected to close this week. A central Ohio melter wants about 1000 tons of low phosphorus iron for the last quarter, and for the same delivery Chicago territory furnishes a prospective purchaser for 1000 to 2000 tons of foundry iron, running 2 to 2.5 silicon. Northern basic, malleable and foundry irons are dull and all three are obtainable around $13 to $13.20, Ironton, for any shipment this year. A few sales of Southern charcoal have been consummated lately around $22.25 to $22.50, Birmingham. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2, soft	13.50 to 13.75
Southern coke, No. 3 foundry	13.00 to 13.25
Southern coke, No. 4 foundry	12.75 to 13.00
Southern gray forge	12.75 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Prices on furnace coke in the Connellsville field have stiffened considerably, and for prompt shipment $1.55 per net ton at oven is about the best that can be done now. Future contract quotations range from $1.60 to $1.75. As only about 35 per cent. of the ovens are in operation in the Wise County district, prices in that field are also firmer and would average about $1.60 for prompt shipment and between that figure and $1.80 for movement during the remainder of the year. Pocahontas quotations are practically the same as those given for the Wise County district and in none of the fields is there any activity. Foundry coke ranges from $2 for prompt shipment to $2.25 per net ton at oven for extended delivery, with only small lots being contracted for. The inquiry is very light and 450 tons of stock coke, wanted locally for nearby shipment, is about the largest lot being worked on in this immediate territory.

Finished Material.—A slightly better tonnage of steel bars was placed last week, but the improvement is looked on simply as a flurry. Prices in this territory are said to be maintained around the 1.25c., Pittsburgh, basis. While there is considerable business in sheets offering, the price disturbance has caused purchasers to hold off until conditions are a little more settled. Structural material continues to hold up reasonably well and hoops are also fairly good sellers. Local warehouses quote steel bars at 1.70c. and structural material around 1.80c.

Old Material.—The railroads have disposed of a little more than the usual quantity of scrap in the past few days, but dealers are holding back taking on any very extensive tonnages, as stocks in yards are said to be large. Consumers are buying in small quantities generally, and, while there does not appear to be any chance for an early improvement in the demand from that source, prices are being firmly maintained. The approximate prices paid by buyers, for delivery in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting sheet scrap, gross ton	10.00 to 10.50

San Francisco

SAN FRANCISCO, August 10, 1911.

The middle of July was about the dullest period so far this year. The month ended fairly well and bookings for the first few days of August have been encouraging, though the market is still very quiet. Many consumers are expected to enter the market on a larger scale next month. As prompt delivery can be had in most lines, merchants are still limiting their purchases. Sheets are in somewhat better demand, though the jobbing trade is still unsatisfactory. A lull has come in cast iron pipe, though more activity is expected soon.

Bars.—Twisted and corrugated bars still comprise a very important part of the tonnage, though there is considerable delay on a number of large concrete jobs. Current orders for soft steel bars are small, though the aggregate tonnage is a little better than last month. There is no disposition in the trade to accumulate heavy stocks. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—New business is coming out very slowly and awards are anxiously awaited on several inquiries. Local building conditions appear fairly good, the official record showing an increase of about $200,000 for July, and the selection of the site for the Panama-Pacific Exposition is expected to have a beneficial effect. Bids have been submitted on the new high school and the Knights of Columbus building, on which orders may be forthcoming very shortly. The Pacific Gas & Electric Company is in the market for a small substation at Sacramento, Cal., and a small warehouse job is up at the same place. Figures are being taken on a court house at Placerville, Cal. For the Standard Oil Company's local building a contract is expected before the end of the year. Action is also expected within a few months on the U. S. subtreasury building. An order is expected within a few weeks for about 350 tons for a theater building at Twelfth and Franklin streets, Oakland, and plans are being drawn for the St. Paul's Church building in Oakland, which will require considerable steel. Plans are up for a hotel at Stevenson and New Montgomery streets, this city, and a large apartment house at Ellis and Mason streets, but the outlook for these structures is uncertain. The Water Board, of Portland, Ore., will receive bids September 1 for 5000 feet of iron fence with 54 posts.

Rails.—Business is beginning to come from some of the new interurban projects. The Northwestern Pacific Railroad is planning a number of improvements, including considerable double-tracking. Its new extension to Eureka, Cal., is progressing rapidly. It is announced that a line from Eugene, Ore., to Coos Bay will be built shortly by Southern Pacific interests.

Sheets.—Several local merchants who do their own corrugating are making up stock for the fall trade and have placed some substantial orders. Aside from this

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buying is confined to narrow limits. Prices are still somewhat depressed in the jobbing market and may continue so for some time.

Plates.—The demand for marine plates continues fairly good, but tank plates are rather quiet. F. C. Roberts & Co. have taken the local water tank contract. The Ensign-Baker Company is preparing to install a large asphalt refinery near San Luis Obispo, Cal.

Merchant Pipe.—Bookings for the first week of August are slightly larger than for the same period last month, but the tonnage is still very light and no material increase can be counted on for the remainder of the month. Large orders are entirely lacking, either from merchants or oil operators. The Pine Mountain Water Company is using wood stave pipe for a 40-mile line near Maricopa, Cal. The town of Oakdale, Cal., is taking figures on about nine miles of 4 to 2-in. wrought pipe. Negotiations have been started for a consolidation of gas plants in Porterville and Tulare, Cal., and neighboring towns, which, if carried out, will involve the laying of additional mains.

Cast Iron Pipe.—The tonnage for the last several weeks has been lighter than for some time previous, recent bookings including nothing of special importance. Most of the business at the moment is coming from San Diego, where the gas and water companies have placed their orders. The city of Los Angeles has purchased about 250 tons of 4 to 6-in. pipe, and the People's Water Company, of Oakland, is buying some pipe of the same sizes. There is no movement to San Francisco at present. A very fair amount of inquiry is noted in Oregon and Washington, though recent sales in those States, aside from an order from Portland, Ore., have been small.

Pig Iron.—There is no general activity in the foundry trade, though some melters report a fair business and occasional small orders are being placed for foreign pig iron to arrive. The general range of values remains about as before, being $20 to $24 for ordinary brands of English, Continental and Chinese iron. No. 2 Southern foundry is nominally $20.50.

Old Material.—The market remains very quiet and all kinds of scrap are accumulating at the yards. The only movement worth noting is a shipment of 3000 tons of steel melting scrap by sea for Philadelphia by the San Francisco Iron & Metal Company. Prices are quoted as follows: Cast iron scrap, net ton, $16; steel melting scrap, gross ton, $10.50 to $11; wrought scrap, net ton, $11 to $15; rerolling rails, net ton, $11.

Birmingham

BIRMINGHAM, ALA., August 14, 1911.

Pig Iron.—A considerably larger business was done in this market last week than in the week previous. It was largely hand-to-mouth buying and comparatively small lots were taken. An aggregate of 2500 to 3000 tons for shipment during the next 60 days was sold around $10.50 per ton, and 1250 tons for strictly last quarter delivery brought $11 per ton at Birmingham for No. 2 foundry. This last consisted of two lots of 500 tons each and a lot of 250 tons, and the unusual price was secured because the brand is given preference by manufacturers of certain lines. A lot of 300 tons of special analysis iron was sold at $10.75 and warrants for 500 tons of No. 2 soft at $10.50, Birmingham. Both of the lots just mentioned are for comparatively early delivery. At this time the schedule of $10.50 per ton Birmingham is being quoted as applicable to deliveries over the remainder of the year by two producing interests only. Grades below a No. 3 foundry, in such quantities as are available, continue to bring 25 cents a ton over the usual differential on a No. 2 foundry basis. It is intimated that No. 3 foundry in round tonnage and for immediate shipment could be had on a lower basis, but sellers generally report that $10 has been their price for No. 3 since the advanced schedule became effective. The amount of No. 2 foundry that has recently been offered producers at $10 Birmingham is very attractive and indicates a disposition to speculate in forward deliveries. The latest development in this market is the announcement by one of the leading producers of an advance to $11 Birmingham for any deliveries of No. 2 during the remainder of this year. We quote the market as fairly active with figures as below being received for shipments within the next 60 days, per gross ton f.o.b. cars at Birmingham district furnaces:

No. 1 soft and No. 1 foundry	$11.00
No. 2 soft and No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25
Off basic	$10 to 10.50
Standard basic	10.25 to 10.75
Charcoal car-wheel iron	22.50

Cast Iron Pipe.—It is formally announced that the plant of the Dimmick Pipe Company has been sold to the United States Cast Iron Pipe & Foundry Company and that operations will soon be resumed. It is understood that with the starting of the Dimmick plant the Bessemer, Ala., plant of the United States Company will be partly closed for repairs and that the aggregate output will not be materially increased for some months. Of the round lot of water pipe recently placed for Portland, Ore., Southern producers were awarded only a part, the remainder going to the Oregon Iron & Steel Company to be made at its Oswego, Ore., plant. The small orders placed in the past week were of fair volume and many additional inquiries are now pending. Without evidence to the contrary, we quote the market as correctly represented by figures last published for such quantities as are being placed, which are as follows, per net ton f.o.b. cars here: 4-in. to 6-in., $23; 8-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe.

Old Material.—Dealers' asking prices are probably stronger owing to the advance in pig iron, but business has not increased appreciably. The demand is principally for light cast with an occasional inquiry for steel scrap and old car wheels. We quote nominally as follows per gross ton f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., August 14, 1911.

The movement in this market is largely on the carload order, there seeming to be no large business available for the dealers to compete over at present. Part of this is due to the fact that the buyers in this territory, to a very large extent, are on their vacations and part to the fact that a good proportion are well loaded up with material for the present and do not care to add to their stocks in the present state of affairs. The activity in old material continues unabated, especially in steel scrap, with prices well held and dealers apparently anxious to get all they can.

Pig Iron.—The pig iron sellers, seemingly, are trying to hold up the market as best they can and more than one is quoting prices with no stock from which to make deliveries, being thus the better enabled to hold fast to higher figures. Some few are letting go at concessions, but these concessions are for immediate delivery only. For last quarter delivery $10 for No. 2 Southern is the lowest possible and there is no anxiety to let go at that figure. The orders that have been coming into the market in the past week have been scattering, running, perhaps, a carload at a time and the aggregate of no imposing proportions. Little is expected in this direction before the first of the coming month. In No. 2 Northern, basic, malleable and the rest there is nothing at all doing.

Coke.—The sales of coke continue largely of the hand to mouth character. The new business for the week will not exceed 2500 tons. None of the large consumers is in the market as yet for new deliveries or for contracts.

Finished Iron and Steel.—The volume of business for the past week held up very well. No large new orders are coming in of individual moment, but the aggregate of smaller orders has been sufficient to maintain a good tonnage all down the line. An encouraging development is the renewed insistence on immediate deliveries, indicating that the buyers are being pushed on their contracts. This is especially true in structural material. In standard section steel rails the business of the week included two orders of 500 tons each and one of 6100 tons, all of which will go into the South-

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west. Another inquiry for 3000 tons is out. All this business is exceptional, as the demand is usually supplied in this market for the year by this time. Plates continue in normal movement. Structural material is continuing to show a good aggregate tonnage but none of the individual orders has been of large size. The fabricators are coming into the market in pretty good shape for stock. The coal mines are ordering small quantities of light rails, but the lumber companies are out of the market apparently. Track fastenings are quiet but firm.

Old Material.—The demand for steel continues very active and all that appears is quickly taken up at firm prices, with the demand apparently unsatisfied. While there is undoubtedly considerable speculation in this market, there is sufficient actual demand to keep the dealers busy in their search for the material. All the railroad lists went at the top prices the past week and more could have been sold had it been available. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than three feet	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

The German Iron Market

Renewal of the Pig Iron Syndicate

BERLIN, August 3, 1911.

The Pig Iron Syndicate has at last been renewed. An agreement was reached on Saturday, July 29. The organization, however, lacks something of the completeness that had been hoped for inasmuch as the concerns in the Luxemburg-Lorraine region are still holding aloof. Seven of these have maintained a sort of loose organization of their own for some time, standing in contrast relations with a combination of dealers; and three others have been and remain wholly independent. The big Rhenish-Westphalian companies with branches in the Luxemburg-Lorraine district have put their furnaces there into the syndicate. The latter will continue negotiations with the ten outsiders, hoping at least to reach a price agreement with them if they still refuse to join. Their joining, however, is regarded as exceedingly doubtful. The syndicate has also still to arrange some details with the Norddeutsche Huette, of Bremen, although that concern has already joined.

The membership of the syndicate is only 40—a surprisingly small number in view of the importance of the German iron industry. The smallness of the membership is chiefly due to two facts: The Silesian and other furnaces comprising the East German Pig Iron Association enter as a single member, and the numerous fusions of recent years have reduced substantially the number of independent furnaces. The Siegerland concerns are all in the new syndicate, although they had refused to join when the organization was first formed a year ago.

The syndicate will continue to make Essen its headquarters. The management will be assisted and superintended by an advisory council, of which Baron von Bodenhausen, one of Krupp's directors, will be chairman. He was Germany's leading representative at the recent international conference of iron and steel manufacturers at Brussels. The present organization is in the form of a joint stock company, modeled after the Steel Works Union. Henceforth buyers of iron will have to send in their orders exclusively to the Essen headquarters and no longer to the individual members. The syndicate, however, controls less than one-fourth of Germany's iron production. The allotments as now fixed amount to only about 3,350,000 tons out of an indicated total production of about 15,500,000 tons for 1911. This fact is due to the circumstance that by far the largest part of the iron made in Germany is converted directly into steel by the producers, and such iron is not under the syndicate arrangement. The final completion of the organization has given great encouragement to the trade, inasmuch as it will undoubtedly tend to smooth the way for the renewal of the Steel Works Union, negotiations toward which will be opened in a month or two.

An Effort to Advance Bars

Movements in the bar trade have been the subject of next importance during the past week. On Friday the members of the old bar convention met at Dusseldorf to discuss the situation. While they could take no binding action owing to the lack of an organization, they gave out a statement expressing their unanimous conviction that a home market price of less than 102 marks for bars of basic steel and an export price of less than 96 marks f.o.b. Antwerp should no longer be granted. Then on Monday the Dusseldorf association of bar dealers voted to advance prices 5 marks. It is regarded, however, very doubtful whether these changes will be adhered to, in view of the go-as-you-please state of things that has prevailed in the bar trade for some months. Prices are not maintained with any regularity outside of the fully syndicated products of the Union.

The band-iron association the other day adopted a price of 127.50 marks, or 5 marks less than the previous list price; but the association has for weeks been itself selling at 125 marks in competition with the independents, and it will doubtless continue to do so. In heavy plates, too, although there is a price convention, and although business in this specialty is unusually active, the price of the convention is regularly cut by about 2 marks.

The cold rolling mills have begun taking orders for the December quarter at unchanged prices; but there is no abatement of the demoralization and price cutting that have characterized this section of the trade for some weeks.

The new Pig Iron Syndicate has begun to take supplementary orders for 1911 delivery at unchanged prices. On August 20 the 1912 list will be adopted. A slight advance is looked for.

A Better Market for Steel Products

The market résumé given out at last week's meeting of the Steel Works Union is rather more favorable than hitherto. The foreign demand for heavy steel rails in particular is described as unusually large; very big orders have been taken and others are pending. The Bavarian State Railways have taken larger amounts than hitherto. Foreign inquiries for grooved rails are uncommonly heavy for the summer season and good orders have been placed. Calls for delivery of rails for mines, both on home and foreign orders, continue satisfactory. Business in structural forms is brisk and the autumn outlook is bright. The foreign market is calling for goods on order at an active pace, but shows a certain hesitancy in placing new orders, due in part to the uncertainty of conditions in the United States. The foreign market for semi-manufactured steel material has improved, but home conditions have hardly changed within the month.

The market for iron shares registered some pretty heavy gains in July, but last week there was some disappointment over the dividend of the Bochumer Gussstahl Company. The market had been looking for a big advance over last year's 12 per cent., but the new dividend is only 12½ per cent. The report, however, is an excellent one, showing gross profits of 6,250,000 marks, against 5,420,000 marks last year.

A Large Seaboard Coking Plant

This week the news from the Belgian market indicates further improvement. Prices still tend upward and are very firmly held. An interesting undertaking is about to be inaugurated near Terneuzen on the Scheldt below Antwerp, where a large coking plant is to be established. It will use English and German coal and the coke produced will be shipped in 40-ton cars to the Longwy region. Ores from the adjacent Briey district will be shipped back to the sea coast as return freight, and they will reach the lower Rhine furnaces at 1 franc per ton lower freight cost than by the pres-

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ent all-rail route. Coke will be produced at Terneuzen at 17.50 francs per ton, as against 22.50 francs in Liege and Charleroi. It is planned to build 160 ovens at present, and further batteries are projected for Antwerp, Vilvorde and Ghent. It is also apparently contemplated to build iron works at some of these points. A secondary object had in view in this movement is to sell illuminating and power gas to adjacent cities, which are both numerous and thriving on the Belgian coast.

Buffalo

BUFFALO, N. Y., August 15, 1911.

Pig Iron.—The week has shown fairly good inquiry for moderate sized lots of foundry grades from New York State and New England points, but a lack of both inquiries and orders for large lots. Buyers for any considerable tonnage are apparently still inclined to preserve a waiting attitude. Orders coming in are principally for carloads and 100 to 500-ton lots. New England bookings in the Buffalo district are restricted by sales of Virginia iron at prices prohibitive of Buffalo competition. Shipments on contracts continue to go out freely, indicating a large consumption. Good sized tonnages are going forward by the Erie Canal. We quote as follows for current and fourth quarter delivery, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.50 to 13.75
Gray forge	13.50 to 13.75
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Trade in general lines of finished products, although somewhat quieter than experienced during the fore part of the month, is of fairly good volume for this season. Specifications on contracts are being received in very good quantity, and one or two agencies report the mills being operated closer to capacity than for some time. Several orders of moderate tonnage for concrete reinforcing bars are noted. Prices for bars, plates and shapes are unchanged. A good many buyers are seeking concessions, owing to rumors that have been prevalent of lower prices having been obtained in some instances, but find they are unable to place orders at less than regular schedules. Considerable activity is reported in sheets, although the business taken is at very close figures and without profit to manufacturers. Business in structural lines continues to show pronounced activity and fabricating concerns report a large number of orders in hand and in sight. Figures are being taken this week for steel for the St. Mary's Hospital at Niagara Falls, about 400 tons. The Riverside Bridge Company, Martin's Ferry, Ohio, has been awarded contract for the fabricated steel for the Buffalo General Electric Company's office building, Buffalo, 1400 tons, to be erected by Josiah P. Wright, contracting engineer, Buffalo. The Lane Bridge Company, Painted Post, N. Y., has received contract for the structural steel for the academy building to be erected by the city of Elmira, N. Y., requiring about 150 tons.

Old Material.—There has been some demand for turnings and borings from outside districts as well as for some other grades of scrap and the local demand has also been good, with light offerings, all of which has caused a firmer feeling, with a slight advance in price in some grades. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.50 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.25 to 7.70
Clean cast borings	7.00 to 7.50

New York

NEW YORK, August 16, 1911.

Pig Iron.—Business in foundry irons continues to be substantially a small lot trade, 500-ton orders being rare. Buffalo furnaces have succeeded in establishing the $13.50 basis for No. 2 foundry iron at furnace for the remainder of the year, but it is still possible to shade this slightly on prompt iron. As a rule eastern Pennsylvania furnaces are asking $14.50 at furnace for No. 2, equivalent to $15.20 at tidewater. There has been considerable interest in the developments of the basic situation for the first quarter of 1912. Few furnaces will entertain proposals for such shipment either in steel making or in foundry iron. However, some business has been done in basic for delivery this year at $14.75 to $14.90 at buyers' works. It is reported that a further order for basic for New England consumption has been taken by a Virginia furnace. Pipe foundries are buying lots of both Northern and Southern iron where the figures meet their views. One such transaction in Southern iron is reported at $10, Birmingham, for No. 3. We quote as follows for Northern iron, tidewater delivery; No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.50; No. 2 plain, $14.75 to $15.

Finished Iron and Steel.—The betterment in the promise of increasing business in finished lines, indicated in last week's sentiment, has more tangible expression in the further accumulation of structural work not yet awarded, in a stiffening of bar-iron prices and in assertions of a stable price in plates. The contracts actually handed out are not specially encouraging. In steel bars those in the strongest position are probably reinforcement bars for concrete structures. Plates have shown a slightly increased demand in the local market and bar iron is distinctly better. Considerable interest is taken in the Filene department store building in Boston, involving 5000 to 6000 tons, but bids may not go in until early next week. The exposition or auditorium building in Fairmount Park, Philadelphia, will require 2000 to 3000 tons. Some of the recent structural awards are: McDonald building, East Nineteenth street, 300 tons, to Lackawanna Bridge Company; Lillie building, Waterbury, Conn., 300 tons, to the Lehigh Structural Steel Company, Allentown, Pa.; Boston & Maine bridge, Greenfield, Mass., 1750 tons, to Phoenix Bridge Company; power house for Yadkin River Power Company, Peedee, N. C., 500 tons, to the Virginia Bridge & Iron Company; building for Standard Oil Company, Baltimore, 200 tons, to Lauer & Harper, Baltimore; Central School, Troy, N. Y., 350 tons, to American Bridge Company, which also recently took the 500-ton Times-Despatch building in Richmond, Va. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.41c. to 1.46c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast-Iron Pipe.—A fair volume of business is reported, with carload lots of 6-in. quoted at $21 to $22 per net ton, tidewater.

Old Material.—Perhaps old wrought pipe has been the most active form of old material in the past week, and the movement has resulted in slightly lower prices. The accumulations of cast scrap are considerable but foundry operations are not such as to create any special demand. Some variations appear in the prices of foundry scrap, the question of credits being a factor. Eastern Pennsylvania steel works have done little in melting stock but the scrap dealers consider the purchase of pig iron an indication that the demand for old material may improve. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T-rails for melting	$11.00 to $11.50
Heavy melting steel scrap	10.75 to 11.25
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.25 to 12.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.50 to 11.00
Light iron	4.50 to 5.00
Cast borings	7.00 to, 7.25
Wrought turnings	7.25 to 7.75
Wrought pipe	10.50 to 10.75
Old car wheels	10.75 to 11.25
No. 1 heavy cast, broken up	10.75 to 11.25
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.50 to 11.00

Ferroalloys.—Consumers are asking for some good round lots of ferromanganese and dealers here are quoting at $37 for delivery through next year. Some little ferrosilicon is being asked for in this market.

SPIESCKER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

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Metal Market

NEW YORK, August 16, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
Aug.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
10	12.75	12.62½	43.05	4.50	4.45	6.00	5.80
11	12.75	12.62½	43.00	4.50	4.45	6.05	5.85
12	12.75	12.62½	.....	4.50	4.45	6.10	5.90
14	12.75	12.62½	43.00	4.50	4.45	6.10	5.90
15	12.75	12.62½	43.50	4.50	4.45	6.20	6.00
16	12.75	12.62½	44.00	4.50	4.45	6.15	5.95

Pig tin is very scarce, and a premium of 2½c. is asked for spot supplies. Copper is rather easy. Spelter continues to advance. Lead is strong.

Copper.—The copper situation is attracting very little attention from buyers who refuse to stock up at prices now asked. Dealers are disappointed, as it was fully expected that the recent excellent report of the Copper Producers' Association would induce consumers to enter the market. There are reports of some sales of electrolytic copper at a shade less than 12.60c., but the usual price demanded is 12.62½c., while Lake is offered at 12.75c. There is really not enough buying to test the market. The London market is very quiet but firm. This morning spot copper was offered there at £56 3s. 9d. and futures at £56 18s. 9d.

Pig Tin.—Not within the memory of some of the oldest dealers in pig tin have spot stocks been so short as they are at the present time. The strike among London dock workers has tied up shipments. Attempts which were made to send tin by way of Southampton and Liverpool were unsuccessful. The consequence is that the London market is glutted while no tin is to be had here. It is only through the good will of one of the largest consumers of pig tin that dealers have been able to supply stocks where they were badly needed. Just now any one who is short of pig tin in this market is in a very bad way, as yesterday attempts to locate a few one-ton lots were unsuccessful and the day before there were some small sales at 43.50c. This was a premium of 2¼c. on the import price. To-day the market here was up to 44c., while in London the market was quiet with spot offered at £190 and futures at £187 7s. 6d.

Tin Plates.—A good demand for tin plates is coming in from jobbers, and can manufacturers are specifying for a few lots. The price is unchanged at $3.94 for 100-lb. coke plates. The quotation on foreign tin plates is unchanged at 13s. 9d. at Swansea.

Lead.—Lead continues to be offered relatively cheaper in New York than in St. Louis. In the latter market the leading interest is meeting the quotations of the outside sellers, but here they are offering lead at fully 15 points less than the St. Louis parity. Consumers are not taking very large stocks and this morning's quotations were 4.45c., St. Louis, and 5.50c., New York.

Spelter.—The spelter market has been steadily advancing as a result of a scarcity of ore in the Joplin district. Labor troubles there have been threatening to limit production. Consumers are buying very freely and the market went to 6c., St. Louis, yesterday, but was down 5 points this morning. Quotation, New York, is 6.15c.

Antimony.—Antimony continues weak, although an increased demand has strengthened prices of Chinese and Hungarian grades. Hallett's is 7.75c.; Cookson's is firm at 8.50c., and Chinese and Hungarian grades are 7.75c.

Old Metals.—The market is inactive, with dealers' selling prices, New York, nominally unchanged, as follows:

Copper, heavy cut and crucible	$12.00 to $12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

AUGUST 14.—A generally quiet week has prevailed in the metal trade, with prices for spelter and sheet zinc slightly higher. Tin quotations have fluctuated, with prices fractionally lower at the end of the week. We quote, Chicago delivery, as follows: Casting copper, 12.65c.; Lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 43c.; small lots, 45c.; lead, desilverized, 4.52½c. to 4.55c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6.00c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

AUGUST 14.—The metal market is in a very satisfactory condition, with the demand good and prices well held. Tin is higher, being 43.45c. against 42.85c. last week. Copper is firm at 13.10c. for Lake and 13c. for electrolytic. Cookson's antimony is well held at 8.85c. Lead is quiet, but the quotation is firm at 4.47½c. Spelter is higher and strongly held at 6c. In the Joplin market the past week the top price for blende was $47 per ton and the basis price was $45 for 60 per cent. zinc. The bulk of the ore brought around $43.50. The weekly output of blende will not be more than 4000 tons for several weeks, as the mines are not yet free from the surplus of water which has been bothering them. The normal output is about 5500 tons per week. At the new price, too, Mexican importations of ore begin to make themselves felt. Calamine was strong at $21 to $24 per ton, with choice lots running as high as $28. Lead ore is stronger at $62 per ton for the top price. Prices of old metal follow: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, August 16, 1911.

The more cheerful feeling in the stock market in the early part of last week, resulting from a slight recovery in prices, was dissipated on Friday, August 11, by a further break which was continued in the market of Saturday, the prices reached on the latter day being the lowest in many weeks. Two weeks of falling prices have raised new questions as to the business situation in the remainder of the year, evidences appearing in the stock market of urgent liquidation. The unfavorable government crop estimates as of August 1 were held, in part, responsible for the further recession. The market showed a slight upturn on Monday of this week and there was a further advance on Tuesday. The range of prices on active industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmers, com.	6¾	Pressed Steel, com..	32 - 33¾
Allis-Chalmers, pref.	20 - 22⅞	Pressed Steel, pref.	99¾
Beth. Steel, com.	30 - 32¼	Railway Spring, com.	30¼ - 34
Beth. Steel, pref.	58½ - 61⅜	Railway Spring, pref.	101⅞
Can, com.	9 - 9¾	Republic, com.	25 - 28⅛
Can, pref.	81½ - 84	Republic, pref.	90⅝ - 92⅜
Car & Fdry, com.	49½ - 53½	Sloss, com.	45 - 47½
Car & Fdry, pref.	115⅜ - 116½	Pipe, com.	13⅝ - 14½
Steel Foundries	36 - 38	Pipe, pref.	51½ - 53
Colorado Fuel	29 - 30½	U. S. Steel, com.	71⅛ - 75⅛
General Electric	151½ - 154¾	U. S. Steel, pref.	115½ - 117⅛
Gr. N. Ore Cert.	46⅜ - 53⅛	Westg. Elec.	64 - 66
Int. Harvester, com.	114⅜ - 118	Am. Ship, com.	54½ - 56
Int. Harvester, pref.	120½ - 124½	Chic. Pneu. Tool.	47⅛ - 48⅜
Int. Pump, com.	32¼ - 38	Cambria Steel.	44½ - 45⅛
Int. Pump, pref.	87	Lake Sup. Corp.	23½ - 25
Locomotive, com.	36 - 38	Pa. Steel, pref.	106 - 106⅜
Locomotive, pref.	104 - 107½	Crucible Steel, com.	12 - 12¾
Nat. En. & St., com.	17	Crucible Steel, pref.	79½ - 81
Nat. En. & St., pref	94½ - 96		

Directors of the United States Cast Iron Pipe & Foundry Company met August 15 and voted to omit the usual quarterly dividend of 1¼ per cent. on the preferred stock for the three months ending August 31. Earnings were said to be more than sufficient for the dividend, but the management thought it advisable to take additional properties and make improvements.

The law for factory illumination in Holland stipulates that the employment of women and young children is forbidden in works in which the artificial light is normally required between 9 a. m. and 3 p. m. An illumination of 1½ foot-candles is specified as the minimum for certain processes exceptionally trying to the eyes, such as embroidery, type setting, engraving, drafting, instrument making, knitting, quilting, etc., and a minimum of one foot-candle in less exacting occupations.

An Improvement in Sulphur Tests

A Method That Insures Against Errors

BY GEORGE AUCHY.*

In *The Iron Age* of November 10, 1910, the writer brought up the fact that the ordinary cadmium chloride evolution method for sulphur in steel and iron possesses not only the plus hydrocarbon error avoided by Wood by filtering but also a minus error, from dissociation of a part of the sulphuretted hydrogen in solution before titration. This latter error is to a certain extent avoided by filtering on account of the cadmium sulphide dissolving slowly in that case, and thus permitting the titration to head off the loss to a certain degree—sometimes perhaps completely. To insure entire accuracy and reliability, therefore, it was found only necessary to add to the precaution of Wood (filtering the cadmium sulphide) that of keeping the iodine in excess of the sulphuretted hydrogen all through the titration. This can best be done, it has since been found, by pouring on the folded-up filter containing the cadmium sulphide and resting in the 8-oz. Fresenius nitrogen bulb in which the precipitation was made, 50 c.c. of 1 to 1 dilute hydrochloric acid previously diluted and mixed with 125 c.c. water, the bulk of the iodine solution that will be required in the titration, and the starch solution. After cleaning out the delivery tube into this mixture the nitrogen flask is agitated until the blue color of the solution first turns to purple, and the titration is finished with the observance of the precaution to add the iodine solution promptly at the appearance of the purple each time.

Filtration Avoided

But filtering the cadmium sulphide, it was found, added greatly to the time and labor of the method and became irksome, and it was wondered if something could not be found which if added to the contents of the nitrogen bulb would neutralize or prevent the disturbing influence of the dissolved hydrocarbons upon the titration, and thus make filtration unnecessary, and permit the use of the author's titration precaution directly on the cadmium sulphide suspended in its liquid. By accident such an inhibitive substance was found to be dilute hydrochloric acid in large excess (50 c.c. in excess of the amount necessary to neutralize the ammonia), with the 7 c.c. ammonia habitually used at that time. But when this amount of ammonia was increased to 10 c.c., as was afterwards found advisable, then the 50 c.c. acid in excess failed of entirely preventing the error, and larger amounts seemed inadvisable. But at this point it was discovered that it was not dissolved hydrocarbons that affected the titration and brought results too high, but simply the slight heat (imperceptible to the hand with the 7 c.c. ammonia first used—that a perceptible heat means high results was well known), generated by the acidification, and that therefore all that was necessary to avoid this error was to cool the liquid before acidification to such a point that the heat ensuing just brought the temperature normal for the titration. At the same time the 50 c.c. excess hydrochloric acid was used as an additional safeguard. Still another safeguard, it was later found, is the running of the liquid containing the suspended cadmium sulphide by degrees, and not all at once, into the mixed water, iodine solution, and starch as below described. In detail:

A 4-gram factor weight of drillings is placed in an 8-oz. Erlenmeyer flask, 50 c.c.; strong hydrochloric acid quickly poured on, and the flask quickly connected with a Troillius bulb holding water, which in its turn is connected by a 100 c.c. pipette (narrowed in the middle of the bulb and top of tube cut off short) with an 8-oz. Fresenius nitrogen bulb containing about 35 c.c. cadmium chloride solution made up as follows:

First stock solution of one pound in 2000 c.c. water. Then 100 c.c. of this mixed with 300 c.c. strong ammonia and 600 c.c. water. After connection, a low flame is applied and when drillings are dissolved, the solution is boiled until the second small bottom bulb of the Troillius gets too hot for the fingers to grasp. The flask is then detached while still boiling, and the apparatus well blown through by the mouth. The Troillius bulb is then placed in cold water and the pipette detached from the nitrogen flask (but not from the Troillius bulb) and stood in a small beaker. The nitrogen flask is provided with a short piece of gum tubing attached to the bulbs at the side. The cadmium sulphide precipitate and cadmium chloride solution are drawn up into these bulbs and kept there by a Mohr compressor clipping the gum tube. Then into the flask thus emptied is poured a mixture of 60 c.c. dilute (1:1) hydrochloric acid, 115 c.c. ice water (ordinary drinking water), the bulk of the iodine solution that will be required in the titration, and a little starch solution. Then to this mixture in the nitrogen flask are transferred the contents of the Troillius bulb and pipette and of the little beaker. The contents of the bulbs at the side are run down into this liquid little by little with shaking, until the color first changes from blue to purple. A few drops of iodine solution are then added from the burette—enough to restore the blue color, and as much more as one dares—and a little more of the cadmium sulphide and cadmium chloride run down from the side bulbs, and so on until these bulbs are emptied and the titration in them finished.

The iodine solution is standardized, not by a standard steel—a very inaccurate process unless the precaution has been observed in the standard aqua regia method to dissolve the drillings with painful (perhaps several days) slowness—but by permanganate and thiosulphate; 10 c.c. of permanganate of iron, strength 0.005585, sets free 0.12692 gram of iodine from excess of potassium iodine acidified with sulphuric acid. But the titration by the thiosulphate must be made promptly in order that the sulphuric acid may not have time enough to also set free some iodine.

Counteracting Errors

As the two errors of the usual method are opposite and therefore tend to counteract each other, it may happen that an investigator may get the same result by the modification described in this paper as by the usual method. But he must not therefore rashly conclude that there is "nothing in" the precautions herein recommended. To satisfy himself of the reality of the Wood error, he need simply make a test as above directed, except with the use of ordinary water instead of ice water, the running in of the cadmium sulphide and chloride all at once instead of by degrees, and the omission of the large excess of hydrochloric acid. To test the reality of the writer's error, on the other hand, let him use the ice water, the 50 c.c. dilute hydrochloric acid in excess and the running in gradually, but omitting the iodine solution from the mixture in the nitrogen flask and titrating as usual. The results of this investigation would occupy considerable space and are therefore omitted from this article.

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Sailing Dates in Foreign Commerce.—A bulletin is about to be issued at Washington by the Department of Commerce and Labor, through its Bureau of Statistics, giving sailing dates from the principal ports of the United States to the principal ports and countries of the world. The publication, which is to be issued as a monthly bulletin or poster, is intended to furnish advance information as to the dates in September at which merchandise may be exported from the ports of the United States to the various ports or countries of the world. It shows that more than 100 different steamship lines or companies have regular sailings from the ports of the United States, and that the fixed dates for sailings during the month of September, as reported to the Bureau, alone number nearly 700. The ports of the country from which there are regular sailings number about 20, and the ports in foreign countries for which sailing dates are named number about 75. This bulletin will be supplied free of charge to those requesting it.

At the recent annual meeting of the Federal Steel Foundry Company, Chester, Pa., Henry S. Grove, H. W. Hand and Albert Strauss, New York, were re-elected directors. Henry S. Grove was elected president, H. W. Hand, vice president, and Charles T. Taylor, secretary and treasurer. The control of the company is owned by the Wm. Cramp Ship & Engine Building Company, Philadelphia.

Systematic versus Scientific Management

A Word of Caution Against Precipitate Introduction of Radical Shop-Working Measures

BY E. C. PECK *

It is hardly possible at the present time to pick up a trade journal or magazine without seeing something about "scientific management." It seems to be a craze for every one who has ever done anything along this line to rush to the front with it, seemingly for fear that unless he gets it before the public, the two or three most prominent exponents of "scientific management" will absorb all the future credit for what seems to be a new era in industrial management.

It is not my intention to argue against a movement toward greater efficiency. I believe in it thoroughly, but I am afraid that it will be much overdone. Attempts will be made to follow fixed laws without the keen discrimination necessary, and disappointments will be sure to follow.

According to Century dictionary, "scientific management" as applied to manufacturing would be a management that had acquired accurate and systematic knowledge of the principles by observation and deduction. This seems to apply to the so-called "scientific management" perfectly, and I have no fault to find if we leave out the word "accurate." On this word the success or failure of the experiment may hinge.

From the layman's point of view, how are we going to know when we have acquired the accurate principles, and if we lay out a system accordingly and inaugurate it, what will happen to it if we discover that the acquired principles are not accurate? The decision as to the accuracy of the acquired principles will rest with the man we have hired as the "scientific management" expert, and the success of the venture will depend entirely upon his ability. He would have to be given full power, and large sums of money would be spent before the results were known. If he does not turn out to be the right man it will not take many experiments of this kind to make owners think there is nothing in it.

The Dependence on Right Man for System Manager

The difficulty of obtaining an A-1 man for any special position and the number of candidates to be tried out is well known, and it would be greater in the case of a scientific manager, because it is comparatively new and accurate knowledge as to his ability hard to obtain. The importance and difficulty of getting the right man is clearly cited by one of the foremost exponents of "scientific management" in his paper on "Shop Management." He says:

> The first step after deciding on the type of organization should be the selection of a competent man to take charge of the introduction of the new system, and the manager should think himself fortunate if he can get such a man at any price.

This statement is so strong that it implies that the success of his system depends upon the ability of the man introducing it. There are a number of men in different parts of the country who are thoroughly capable of installing and carrying out "scientific management," and these men will make a success of it; but there will be a hundred who have had only a smattering of training along this line and who are not so capable. These are the ones to look out for, because they only think they know, and a great deal of money will be spent and many a shop turned up side down before one realizes that he has the wrong man.

Not One Best Working Method for All

Several of the most widely-known exponents of "Scientific management" state specifically that there is just one best way for every man to do a given piece of work. I do not agree with this except as applied to the most primitive work. There is a best way for a man to do a piece of work but this way may not be the best for another man. No two people think and act alike and the best set of movements for one man may be entirely wrong for another owing to his particular make-up. At work requiring skill a man who is speedy and naturally deft with his hands would have a different best way from the man who is less skilful and less speedy but stronger. I wonder how many would actually be competent to decide which is the one best way to play baseball and what kind of a game it would be after the players had been instructed in this way and tried to use it. No doubt every barber shop in the country could furnish one or more experts who could tell how it should be done and the game would be benefited just about as much as some industrial plants are by installing "scientific management."

Collecting Unnecessary Data

From the foregoing it might be inferred that I am against "scientific management" and that I am not in favor of the general movement toward greater efficiency. To prevent this article giving the reader the wrong impression I want to state positively that I am in favor of any system which will produce more and better work for less final cost, provided the workman receives a percentage for his increased effort and skill. I am also in favor of collecting and keeping the necessary records for conducting the business in a systematic manner but no more. Collecting unnecessary data costs money and is of about as much use as tail feathers would be on a pig. Systematic management would be a better name for the particular brand that I favor, because if a business is systematically reorganized from top to bottom by a competent man the leaks and weaknesses will be discovered. It will also be found where new blood is needed and then the best attainable should be gotten.

An industry with a first-class man in charge of the manufacturing and working piece work will not be benefited much by "scientific management" because if the man is first-class he will systematize and organize everything under him and he will have actual knowledge of the details of all the work and know whether or not his costs are right. He will also have the necessary records to do this with, if he has to sit up nights to get it. He will be in fact systematic manager and a scientific manager according to some without the planning department. He is his own planning department and having *accurate knowledge* of the details of the work will only need clerks to tabulate it for him. He will not be fooled by the many excuses followed by the sharp ones to get a high rate because the men soon know how much the boss can be fooled. He will not insist on every man doing a piece of work the exact same way, even his way if he can produce results another way.

Cases of Costly Scientific Management

In one small shop with which I am familiar, an expert (?) has succeeded in saving $965 per year over previous methods, but the collection of the enormous amount of data necessary for him to do this cost $1,000 for the same period, and as every slight change in the article manufactured makes most of these data obsolete, no reduction of this $1,000 is in sight. Adding the salary of the expert, this makes "scientific management" in that shop rather costly.

A man who thoroughly understood his business would have figured out the saving and compared it with the cost of collecting the data before going ahead. He should have seen that there was no saving, and then either reported this finding or attacked the problem from a different angle.

Another expert told a certain large concern, after spending several days in its plant, that its drilling was costing ten times what it ought to, and being a very fluent talker he was employed. He went around the shop and picked out the best men and induced them to drill a number of different size holes for him in the quickest possible time.

*General superintendent, Cleveland Twist Drill Company, Cleveland.

He plotted these results and according to the rules laid down by the different writers, he made an operation sheet with prices for the drilling. In his estimation he had accurate and systematic knowledge of the job on hand and all that remained was to get the management to stand behind him and the results would be forthcoming. Some of the results were: a hairbreadth escape from a good healthy strike; loss of a number of good men; a barrel of burned-up drills; another of broken ones; a carload of scrap castings, and a state of affairs in general that made the owner "hit the ceiling" every time anything about "scientific management" was mentioned.

Incompetent Managers the Cause of Failures

The reason for this failure was the lack of judgment and ability of the expert. He should have known that hard dirty castings could not be drilled at the same rate as soft clean ones, and that wornout drill presses with a great deal of spring in them would break drills if pushed too hard. If he insisted on drilling at this rate, he should have seen that his working conditions corresponded with his test conditions, both as to material and machines. He should have taken the human factor into account or instituted a system of inspection and routine so accurate as to be able to ignore this element.

A man who understood his business afterward put this shop in good order and succeeded in doing the drilling for about one-fourth of what they were originally paying. He systematized the work, organized the inspection of material and put it on a straight piece-work basis. I am afraid he would not be called by some authorities a "scientific manager," but he produced results at a very low cost, and when I visited this place I formed the opinion that it would be a long time before any expert would be able to lower the cost in this plant.

Disastrous So-Called Scientific Management

Another well-known concern with an enviable reputation for good work was built up and managed by two men; one in charge of the business end, the other of the entire manufacturing. The business started in a small way and, owing to the energy and ability of the two men, grew until they employed about 400 men. The business was profitable and healthy but the two men running it were sadly overworked, and needed each a good assistant to carry part of the load. The stockholders decided that what they needed was "scientific management"; that they had outgrown their system and that the two men who had built up the business did not know what modern organization was, but they might handle the new organization after they were properly trained.

After the scientific management expert got the place organized (?), the man who formerly handled the business end was made general manager with the office of secretary and treasurer, and given as assistants an office manager, chief engineer and chief draughtsman. The man who looked after the entire manufacturing end was made superintendent and given as assistants an assistant superintendent, master mechanic and production expert. It is hard to believe that stockholders could be talked into this large increase in the overhead against the advice of two such capable men, but they were firm in their opinion that they were behind the times.

The red tape under the new system handicapped the heads of the business and in turn every one down the line to such an extent that orders could not be got out, mistakes of costly nature occurred, traceable to errors in the engineering department or to improper relations between this department and the factory. New ways of doing things raised the cost in place of cheapening it. This was partly due to the friction in the organization and too many bosses; it took more time to correct errors than it formerly did to do the work. This company struggled along with this state of affairs for nearly two years and is at the present time in the hands of a receiver.

Human Factor of the Utmost Importance

Most of the writers on "scientific management" fail to place the proper value on the human factor. In my estimation it is of the utmost importance, and I believe when the end is reached it will be found that the saving effected will be inversely proportional to the skill required to do the work.

Most of the examples of large reductions in cost are those which require little or no skill and no brains at all. It seems perfectly logical to state that the more brains a man uses and the more skilful he is, the harder it is to improve on his methods. This has been my experience, and it is not at all uncommon to find skilful men producing first-class work in rapid time by almost diametrically opposite methods. How many of the experts are qualified to say which method is the right one, and would the man using the other method be let go if he could not maintain the required pace when forced to work by another method than the one at which he can produce results?

Again, some men are so skillful that they would make a poor method successful, and some are unskilful enough to make a failure of a good method. The man who can discriminate in this case will have to have no small amount of judgment and ability, and while I admit there are some who are qualified in this respect, there is going to be an epidemic of experts who will make enough failures to discredit the system.

Initiative of Mechanic Not to Be Checked

My principal objection to "scientific management" as laid down by several of the best known writers is that it tends to destroy the ambition of mechanics, because they are not allowed to work and think for themselves, but must follow a blueprint. It is well known that real first-class mechanics will usually find quicker and better means for doing the work than any imported expert, and this skill ought not to be hampered.

Twenty years ago apprentices were taught to be all around mechanics. When they were given good work to do, they were told that Sam Jones did it the last time in nine hours and the work was O. K. The apprentice's ambition was to scheme to do it in less time, because Sam Jones' ability was a well-known standard in that locality. He looked forward to the day when his work was to be held up to someone else following him up the ladder. His ambition was to be the best all-around machinist in the town, knowing that when he had that reputation he could command a high salary and have a standing of importance in the community.

In most shops to-day apprentices are made into specialists and there is a scarcity of all-around men. The majority of the good shop managers I am acquainted with were once skilled tool makers, and when a good mechanic has learned to think he usually makes good. Training the rank and file as specialists for manufacturing is the correct idea but let us have all the first-class tool makers we can educate.

Blueprint Working Not a Training for Skilled Leaders

If we adopt systems which take away the ambition and initiative of the future skillful men, we will find ourselves without the very ability and skill which will be needed at the productive head of any systematized industry.

The prime requisites for a systematic producer are ability, judgment and "stick-to-itiveness" and he can hardly be a "top notcher" unless he has had enough practical training to make him entirely familiar with all the details. If none of this kind of men is trained and we are forced to put either blueprint-trained men or the best of the automatons in charge of our production in the future we can expect but little advancement. The United States is ahead of the world in mechanical manufacturing and it is due principally to the efforts of good mechanics who have trained themselves to be good thinkers as well. We want greater efficiency all along the line—managers, engineers and workmen—but we don't want any kind of system which handicaps originality, thought and skill in the workman, engineer or manager. We should strive to make more good mechanics and induce them to study and think so that when needed they can fill responsible positions.

The Knox Pressed & Welded Steel Company, Niles, Ohio, and the Keystone Furnace Construction Company, the latter being patentee of the Knox welded-steel water cooler ports, doors and frames for open hearth furnaces, have removed their offices from the Fulton Building to room 618 Farmers Bank Building, Pittsburgh.

The Steel Corporation Investigation

George W. Perkins and W. C. Temple, Steel Pool Commissioner, Give Testimony

George W. Perkins, a member of the Executive Committee of the United States Steel Corporation and formerly chairman of its Finance Committee, gave testimony before the Stanley Committee at Washington last week, his examination covering three days. The questions of Chairman Stanley and other members of the committee covered a wide range. In the first place the purchase of the Tennessee Coal, Iron & Railroad Company by the Steel Corporation was taken up and again gone into in detail, but without developing any new information. To the suggestion of conspiracy to drive the Tennessee property into the market Mr. Perkins said nothing was ever more false than such a statement. Mr. Schley, he said, having loans to meet, wanted in any way possible to pay his obligations and the situation was such that the Steel Corporation was his only available relief.

Questions were asked as to J. P. Morgan's relation to the Steel Corporation and Mr. Stanley read from the minutes of the Executive Committee of the Corporation a statement by Judge Gary to the effect that Mr. Morgan was the financial head of the house that had the responsibility of bringing out the Steel Corporation and he (Judge Gary) thought that Mr. Morgan should have the opportunity of being consulted as a member of the board of directors or otherwise. Mr. Perkins admitted that that was the policy from the beginning.

As to the average balance the United States Steel Corporation had on deposit with J. P. Morgan & Co., Mr. Perkins said he could not tell from memory, but that the Corporation usually had from $40,000,000 to $70,000,000 in accounts all over the world. He thought the interest paid was, as stated by Chairman Stanley, 2.6 per cent.

Political Contributions

A long examination was conducted on the political contributions made by the Steel Corporation. The minutes of the Executive Committee showed, as cited by Chairman Stanley, that requests were made at different times for contributions by the corporation to campaign funds, and it was stated in the minutes that "the written opinions of John G. Jackson and David P. Watson were received that this corporation has no right to make contributions for political or charitable purposes."

The minutes were quoted from to show that the corporation made a contribution of $2,000 to the American Protective Tariff League; also that $1,000 was contributed to help publish a book "Protection and Prosperity," by George B. Curtis of Binghamton, N. Y. In reply to the question, "Wasn't it your fixed policy to make liberal contributions to further a political dogma which you regarded profitable to your business?" Mr. Perkins said that all such developments were before Attorney Jackson gave his opinion in 1906. Since that time the witness said he had no knowledge of such contributions.

Mr. Perkins was asked whether when he was connected with the New York Life Insurance Company contributions to campaign funds were made by that company and he refused to answer on advice of counsel. He was also asked as to personal contributions to campaign funds and was advised not to answer, though at one point in the colloquy he expressed a willingness to give the information. However, objection was made by one of the members of the committee to this line of inquiry, and after threatening to have the witness cited before the bar of the house for refusing to answer, the chairman asked for an executive session of the committee. The outcome was a decision not to insist upon answers to the questions concerning personal campaign contributions.

The Bond Conversion Scheme

Considerable time was taken up with discussion of the plan brought forward by Mr. Perkins in March, 1902, for the conversion of $200,000,000 of the preferred stock of the Steel Corporation into 5 per cent bonds and the issue of $50,000,000 additional bonds to meet the corporation's need of funds to complete extensions which were under way when the various properties were taken over. This is familiar history to the iron trade. The chairman of the committee endeavored to discredit the conversion scheme and in this respect his position was not different from that of many persons in and out of the iron trade who watched the workings of the conversion plan in 1903. In commenting on this portion of Mr. Perkins's testimony the New York Evening Post of August 12, has the following as to the result of the bond conversion syndicate's operations: "Before the syndicate had completed its operation, the syndicate agreement was cancelled and terminated at the request of the finance committee of the Steel Corporation itself; in response, apparently, to protest by some large interests in the company. Instead of raising $50,000,000 in cash without cost, and saving $1,500,000 in annual charges (as Mr. Perkins had described the proposal in reporting it to the Steel Corporation's Executive Committee), the Steel Corporation as a matter of fact placed an additional mortgage for $150,000,000 on its property, converted a contingent annual charge of $9,200,000 into a fixed charge of $6,500,000, raised $20,000,000 cash costing $1,000,000 a year and paid the sydicate a commission of $6,800,000."

Special Prices to Large Consumers

Chairman Stanley asked whether one result of the formation of the Steel Corporation had not been to give special prices to "powerful favorites" rather than to reduce prices to the general consumer. Mr. Perkins said consumers generally had been benefited. Mr. Stanley then read from the minutes of the Steel Corporation of July 15, 1902, whereby it was agreed to sell tubes to the Standard Oil Company at 5 per cent. below the prevailing price. Mr. Perkins said he knew nothing as to whether such an agreement was still in existence.

There was a long discussion over the records of the purchase of the Clairton Steel Company from the Crucible Steel Company in 1903. Minutes of the Steel Corporation showed that the contract was written providing that the Crucible Company should not enter into competition in making similar products to those of the Clairton Company, namely, billets, for a period of ten years. The contract finally signed did not contain that restriction, however.

Counsel Lindabury, for the Steel Corporation, declared that such a restrictive provision had been declared legal by the courts many times. Chairman Stanley replied: "If there is such a gap in the Sherman law as would permit such proceedings the committee will have business on its hands before it gets through."

Some Constructive Work Needed

On several occasions in the course of his examination Mr. Perkins expressed himself strongly on the necessity for constructive work on the problem of controlling great consolidations. One of his suggestions was that a government commission which would give publicity to the affairs of the large corporations would be useful. These corporations, he said, which had grown up under the demands of existing conditions, could no longer successfully go on under the Sherman Anti-Trust Law as now rigidly enforced. The government's dissolution of the Standard Oil Company had served as the waving of a red flag of warning to every corporation in the United States. The establishment of a government bureau which could give accurate information to the public as to the condition of corporations would be an active inducement to the people to make wise investments. One of the most striking developments of the present system of conducting business on a large scale is the dividing of great interests into the hands of many investors rather than concentrating them in the hands of a few.

W. C. Temple a Witness

At the final session of the Stanley Committee on Saturday, August 12, at which it adjourned to meet again on

October 16, W. C. Temple, of Pittsburgh, where he was commissioner of the plate, shafting and structural steel pools, was a witness. He is now engaged in fruit growing in Florida. Mr. Temple explained the plan of organization and methods of working of the various pools. He said that the termination of the plate and structural associations was due to Judge Gary, who refused to go on with what he believed to be an illegal arrangement.

Methods of the Pools

The first combination was made in 1897, and discontinued in December, 1904, when by a gentlemen's agreement every scrap of paper connected with the pool contract was burned. It was by the accident of a copy having been kept by the printer who turned it over to Mr. Stanley that the matter was uncovered. Mr. Temple had authority to manage all details, investigate business, production, and shipments. These pools distributed the tonnage among the various manufacturers in the pools, and there were arrangements for enforcing the agreements. Guarantee funds were provided by contribution of the different members in proportion to the tonnage assigned to them, and there was power in the commissioner to enforce penalties against concerns violating the agreement. Mr. Temple insisted, however, that penalties were practically never enforced.

Referring to the "prince or pauper" description of the steel trade, the witness said: "If you will put capacity at, say, 100, and consumption at 110, it is all champagne and terrapin for the steel man. But if consumption is 90 it is free lunch or corn bread and pork only. In no other business will such a slight difference in the per cent. of consumption decide between success and failure."

"What is a fair per cent. of profit for the steel maker?" asked Mr. Stanley.

"Twenty per cent.," replied the witness.

Structural Steel Percentages of 1897

A copy of the agreement for the structural steel pool entered into in 1897 was laid before the committee and witness. This agreement apportioned to its members a percentage of sales as follows: The Carnegie Steel Company, 49⅜ per cent.; Jones & Laughlin Steel Company, 12⅞; A. & P. Roberts Company, 11½; Passaic Rolling Mill Company, 6; Phoenix Iron Company, 5; Cambria Iron Company, 5; Universal Construction Company, 4½; Pottsville Iron & Steel Company, 3; Cleveland Rolling Mill Company, 3.

Under the agreement each member of the pool was bound to make a sworn statement of its production and shipments each month. If one member produced more than its allotted share, it was forced to pay a fine of 0.5 cent for each pound of steel shipped over the allotted amount. Firms failing to ship up to their allotment received 0.5 cent a pound for their shortages. These rates later were changed to 0.35 cent a pound, or $7 a ton. A guaranty fund of the pool was provided, each member being assessed originally $2500, and $500 a month thereafter.

One portion of the agreement provided that "the New Jersey Steel & Iron Company and the works of the said New Jersey Steel & Iron Company shall remain inoperative in the manufacture of certain beams and channels during the life of this agreement, in consideration of which the New Jersey Steel & Iron Company shall receive from the association the sum of $5000 per month."

Judge Gary Opposed the Pools

Mr. Temple said that all these pools ceased to exist in 1904, and he declared that they were broken up by E. H. Gary.

"What," Chairman Stanley exclaimed, "do you mean Judge Gary, the chairman of the Steel Corporation Board of Directors?"

"Yes, Judge Gary declared that he did not believe in these associations. He said they were no longer necessary or desirable, and he demanded the abrogation of all such agreements and the discontinuance of business under them."

Mr. Temple produced in connection with the structural steel agreement a price list, in which the country was apportioned and different prices fixed for various sections.

"Under that agreement were the members of the association able to adhere to the price list?"

"After the bitter warfare in the steel business prior to 1897 it was difficult to hold anybody, but after 1904 I may say there was no destructive competition." Speaking of the plate pool, the witness said:

"I knew intimately all the concerns in the Steel Plate Association—knew them far better than they knew each other. I got all the facts in strict confidence. When complaint of violation was made I took it up at once. At first nobody much reported, and about everybody broke the agreements. In those days every man in the steel business carried a tomahawk. The Carnegie Company was never caught, but once it complained of a competitor violating its agreement. This competitor had taken the steel for a building at a very low price. The head of the company said: 'My boys made an awful mistake; they figured on a ten-story building when it should have been eleven!' No fine was imposed, but that sort of excuse was typical. The concern was allowed to go and sin no more. The association continued until 1904. At the outset the people were all afraid of each other, bitterly hostile. At the end of a year they got friendly, exchanged information, and made business more like a family than a warfare."

The International Harvester Company's Statement

Edgar Bancroft, counsel for the International Harvester Company, presented to the committee a reply to the report of Assistant Attorney-General Townsend on the Harvester combination in 1908, this having been placed in the record of the Stanley Committee. He said that nearly every important statement in this report relative to the purpose of the investigation was either grossly inaccurate or entirely untrue. The report charged that the knotter in the self binder is protected by patents and that the International Company owns the patents on all the best types of knotters. Mr. Bancroft said that there is no patent whatever on the essential part of any type of knotter and there has not been any in force since 1896. Neither are there any existing patents on any essential part of the grain-binding machine. The charge of a binder twine trust he declared to be without foundation. The Harvester Company's relation to the United States Steel Corporation is not different from its relations with the competitors of the Steel Corporation. In the past seven years it has bought 10 per cent. of its total needs from the Steel Corporation and 30 per cent. from competitors of the Steel Corporation, while the remainder is supplied by its own subsidiary, the Wisconsin Steel Company. The charges of higher prices for harvesting machinery were also answered. While raw materials have increased more than 30 per cent., the company did not increase its prices until 1908, and then only 7 per cent., while for 1912 a reduction of 5 per cent. was announced last month.

Quotations were made from the government's own reports from foreign countries showing that harvesting machinery was sold abroad at higher prices than in the United States in spite of what Mr. Bancroft pronounced the "perennial falsehood" that agricultural machinery is sold cheaper abroad than at home.

Further Sessions

It is stated that Andrew Carnegie and J. Pierpont Morgan will appear before the committee in October. Mr. Morgan will be examined not only to testify regarding the affairs of the Steel Corporation, but will be asked to aid the committee in formulating recommendations to Congress of legislation deemed necessary to meet the demands of industrial organizations as they exist to-day.

In the recess Chairman Stanley and a force of assistants will work up further evidence. The matter of control of transportation facilities by the Steel Corporation is to be a special subject of inquiry in later sessions of the committee. It has been decided to call on the Steel Corporation for the books of all subsidiary companies as well as those of the corporation itself. Chairman Stanley announced that the committee would not go further into the affairs of the International Harvester Company and its relations with the Steel Corporation at this time, as he had information that the Department of Justice intended to take action in the case of the Harvester company.

Efficiency in Boiler Plant Operation

Steam Making as a Manufacturing Proposition—An Example of Scientific Management

Efficiency management of the steam-boiler plant and the operation of the plant as a factory which produces steam are two messages of high practical value given in a paper by John A. Hunter, steam engineer of the American Sheet & Tin Plate Company, read before the Engineers' Society of Western Pennsylvania and published in the July issue of the Proceedings of that society. The author paid special attention to cost sheets and efficient superintendence, and related two experiences. One was to prove the value of giving the boiler plant the same close, watchful oversight commonly accorded the other departments of an industrial establishment, and the other, reprinted below, exhibited the satisfactory results of studying in a detailed way the items of expense which should be considered as the essentials of a cost sheet.

The first case related to the operation of a water-purifying system. The plant was installed in 1904. Until 1908 no system of reports or records of the treatment of water was kept. During this period almost the only benefits derived were the neutralization of the free acid and possibly a slight reduction in the incrusting solids. In 1908 a regular system of reports was started and the treatment of the water was increased so that it was completely treated. The table shows the tube renewals per 1,000,000 boiler hp. hr. operated per year:

1907	49.83 tubes
1908	19.25 tubes
1909	6.59 tubes
1910	0.67 tubes

The second case is that of a boiler plant which was being operated at an efficiency varying from 50 to 55 per cent. In order to increase this it was decided to put a man in charge whose duties would be to keep the plant operating at the highest efficiency possible.

The following is a brief description of the plant: Fourteen water-tube boilers equipped with chain grate stokers, coal and ash-handling machinery, an intermittent water purifying system and auxiliary apparatus, such as Venturi meter, recording feed-water thermometer, recording steam-pressure gauge, recording CO_2 machine, damper regulator and feed-water regulators. The accompanying table shows the efficiency and actual cost of operation for an average month before and after the boiler superintendent had been put in charge. The month of March was before the man had been put in charge and January after:

Table Showing Results of Efficient Boiler Superintendence—Cost per 1000 b. hp. hr.

	March, 1910	January, 1911
PRODUCING LABOR—		
Superintendence	.....	$0.0566
Unloading fuel	$0.0504	.0334
Coal crushing	.0384	.0506
Firemen	.2206	.1992
Ash wheelers and conveyor tenders	.0744	.0653
Water and feed pump tenders	.1204	.0962
Boiler washers and cleaners	.0046	.0615
Attendance water purifying plant	.0691	.0607
Total Producing Labor	.5779	.6234
LABOR IN REPAIRS AND MAINTENANCE—		
Buildings	.....	.0715
Coal handling and crushing machinery	.0086	.0024
Ash handling machinery	.0016	.0023
Stokers, burners, grates and attachments	.0045	.0014
Boilers and fittings	.0497	.0441
Steam mains and pipe coverings	.0063	.0023
Feed water heaters and pumps	.0033	.0046
Water purifying or filter plant	.0002	.0115
Total Labor in Repairs and Maintenance	.0742	.1403
MATERIAL IN REPAIRS AND MAINTENANCE—		
Buildings	.0001	.0485
Coal handling and crushing machinery	.0070	.0053
Ash handling machinery	.0184	.....
Stokers, burners, grates and attachments	.0054	.0144
Boilers and fittings	.1062	.1174
Steam mains and pipe coverings	.0146	.0182
Feed water heaters and pumps	.....	.....
Water purifying or filter plant	.....	.0042
Total Material in Repairs and Maintenance	.1517	.1968
LUBRICANTS	.0066	.0056
TOOLS AND MISCELLANEOUS SUPPLIES	.0316	.1085
Total Cost Above Fuel	.8420	1.0746
Coal fired, tons	4661	3878
Average price coal, per ton	1.56	1.56
Number of 1000 h.p. hrs	1699	2031
Cost of fuel per 1000 boiler hp. hrs	4.2797	2.9787
Grand total cost, including fuel	$5.1217	$4.0533
Boiler efficiency, per cent	53.3	62.0

From these figures it is seen that the efficiency of the plant was increased from 53.3 to 62.0 per cent., and the grand total cost per 1000 b. hp. hr. was reduced from $5.12 to $4.05, or a saving of $1.07 per 1000 b. hp. hr. If an operation of 7000 hr. per year is assumed the saving would be $7.49 per b. hp. year. It is to be noted in the above figures that the total cost above fuel apparently increased, but that is not altogether correct. A small part of the increase is accounted for by the wages of the boiler superintendent, but the greater part is due to the fact that more money was expended for repairs and maintenance.

In conclusion the author asserted that whereas the system as outlined seems somewhat elaborate, yet the results from systematic operation of the plant fully justify the trouble and expense. It is the opinion of the author that an investigation of an average boiler plant in industrial works will reveal even greater possibilities of improvement than those given.

Railroad Equipment Orders.—The Pennsylvania Lines West are asking for bids on 700 freight cars and the Baltimore & Ohio is in the market for 10 baggage cars. Among orders recently placed were the following: The Atlantic Coast Line, 900 box cars and 100 flat cars, from the Standard Steel Car Company; Swift & Co., Chicago, 50 tank cars, from the Pressed Steel Car Company; Missouri Pacific, 15 baggage cars and 14 mail cars, from the American Car & Foundry Company and 21 cars from the Pullman Company; the American Railways of Porto Rico, 4 compound consolidation locomotives, from the American Locomotive Company; the St. Louis & San Francisco, 12 switching locomotives from the Baldwin Locomotive Works; the Chicago & Eastern Illinois, 8 Pacific type locomotives from the Baldwin Locomotive Works. The Pittsburgh, Shawmut & Northern has ordered 500 all-steel hopper cars.

A New Ohio Wire Mill.—The Ohio Steel & Wire Company has closed negotiations with the Warren Board of Trade, Warren, Ohio, for the establishment of a new wire mill in Warren. A 12-acre site has been donated to the company, which will have a capitalization of $400,000. A one-story building with about 80,000 sq. ft. of floor space will be erected. The company will make light wire for various purposes. Until September 1 its offices will be in the Columbus Savings & Trust building, Columbus, Ohio. It officers are the following: President and general manager, E. A. Henry; vice president, L. C. Connor; secretary and treasurer, Charles C. Hubbell.

The latest roofing catalogue of the American Sheet & Tin Plate Company, Pittsburgh, consists of 42 pages of illustrated, descriptive and tabular matter, dealing particularly with the Apollo brand of galvanized roofing and siding, and the American brand of plain and painted material. Seven standard widths of corrugations are manufactured; namely 3/16, 5/8, 1¼, 2, 2½, 3 and 5 in., and the full standard weights per square are given under the illustration of each product. Photographic reproductions are given also of curved corrugated sheets, pressed standard seam roofing, crimped roofing, roll roofing, corrugated flashing, and various forms of siding, including weather board, rock face and beaded. Standard weights per square of corrugated sheets, formed roofing and siding products, are added together with diagrams showing the application of corrugated sheets for roofing or siding.

A test of a Maxim water tube boiler is referred to in a recent letter of Allan Stirling, maker of the boiler, Drexel Building, Philadelphia. In a boiler with the Alison patent economizer or fourth pass, the temperature of the steam on test was 357 deg. F., while that of the escaping gas was only 312 deg. F. In the economizer the gases pass downward while the water rises and a partition is provided in the lower drum to prevent the feed-water from getting into the boiler circulation until it has been heated and purified in the economizer tubes.

The Warner & Swasey Company, Cleveland, Ohio, has directed attention to the 30th anniversary of the company by the distribution of a souvenir card showing the modest plant of August 5, 1881, and the imposing one of August 5, 1911, the latter view including the important additions made in the past two years.

Latest Development in Slag Pots

Transportation of liquid slag in large quantities from open hearth furnaces presents characteristic conditions with which it is necessary to contend. At blast furnace plants the slag can be handled so that a car and pot may

Berg Slag Pot, Showing Reinforcing Straps.

run on a track opposite the cinder notch, and the furnace flushed into the ladle, following which the car may be pulled out. As distinguished from this method, the practice of open hearth plants is to employ about three pots for each car. The empty pots are placed in receptacles or on stands alongside of the furnace, and next to the steel ladle, and the slag is then permitted to run over into them. Each pot is allowed to stand thus until filled, and is then lifted to the car, which operations, unless special provision is made, are accompanied with considerable spilling of cinder around the ladle and the floor.

For the convenient meeting of these conditions and for the purpose of furnishing a design capable of withstanding great strains, the Wm. B. Pollock Company, Youngstown, Ohio, is building the open-hearth slag car, illustrated in *The Iron Age* of March 23, and in the accompanying views. The ladle pot is picked up by means of a suitably designed bail hung from a crane and is placed in the ladle car. The pot is set in a trunnion ring, where it is securely locked for transportation to the dump. The tipping device is operated by steam or air from the locomotive, under the control of the train crew.

Inclined Lifting Hangers on the Bail.

In the usual blast furnace cinder pots the continued expansion and contraction with each alternate filling and emptying results ultimately in the pots cracking horizontally along the line of the surface of the hot slag. Where the pot is permanently fixed in the ring of the car there is not so much danger of the car breaking at these cracks and spilling the liquid slag. In open hearth practice, however, where the pots are lifted it is necessary to provide against the possibility of their breaking. To this end they are reinforced externally by a pair of steel straps extending from top to bottom of the pot. These straps are of considerably greater tensile strength than the material of the pot and can be tightened by the nuts on the lower end of the straps. In this way the lifting strain may be transferred to the bottom of the ladle and thus prevent a failure at the usual line of cracking.

The lifting hangers on the bail are inclined in the same direction as the sides of the ladle, so as to engage the lugs close to the ladle and to avoid any tendency to strain or distort the shape of the pot. The capacity of the ladle illustrated is 260 cu. ft. of liquid slag. The car is of the Berg type, standard gauge, M. C. B. trucks, all steel construction, and of 100,000 lb. capacity.

Customs Decisions

The Board of United States General Appraisers has overruled a protest filed by the John A. Roebling's Sons Company. The merchandise consists of wire-drawing plates, of steel, about 2 in. x 1¼ in. and 7/16 in. thick. The local appraiser reported that these articles are made by drilling holes through pieces of rolled steel. The importer set up several claims, all of which are denied by Judge Fischer, who writes the decision for the tribunal. One of the claims was that the goods are forgings, but the decision says that there is nothing in the record to show that the articles are forgings. In fact, the appraiser reports them as articles of rolled steel. The collector's assessment of 45 per cent is affirmed.

The board has also decided unfavorably to the Washburn Wire Company and others a claim dealing with the classification of drawing-plates. They were assessed at 45 per cent ad valorem, and were claimed dutiable at lower rates under two paragraphs of the tariff law.

In overruling a protest filed by the Cleveland Stamping & Tool Company, the Board of United States General Appraisers has decided that merchandise which consists entirely of steel, such as handles and spouts which have been stamped from sheets of steel and then spun into shape, or otherwise manipulated to produce completed steel articles for use in the manufacture of enameled steel ware, must stand duty at the rate of 45 per cent., and not at lower rates as claimed by the importers.

A controversy between the Government and the Chicago Junk Company was decided in favor of the United States. In these cases the merchandise consisted of old rails, old steel belts, scrap iron and other products. They were all returned by the collector at 45 per cent., as being manufactures in chief value of metal. The importers claimed that the goods are entitled to entry at $1 a ton as scrap iron or steel. It was also claimed in the alternative that the old metal is free of duty as junk, or dutiable at 10 per cent. as waste. The claims are all overruled.

The Illinois Central Railroad Company was defeated in an attempt to secure lower duty on cylindrical drums used in the importation of crude glycerine. The collector assessed the drums separately from the contents at the rate of 30 per cent. ad valorem. It was alleged that the drums are usual coverings and as such free of entry. This claim the board denies.

The Allegheny Steel Company, Pittsburgh, which manufactures steel sheets, plates, boiler tubes, sheet and tin bars and other products at its Brackenridge, Pa., plant, has opened an office at Room 100 Third National Bank Building, St. Louis. J. A. Armstrong, who has been connected with the sales department of the company at Brackenridge, Pa., for seven years, is in charge.

Haselton Plant of the Republic Iron & Steel Company

New Open Hearth Furnaces, Blooming Mill and Billet and Sheet Bar Mill

In connection with a description of the Republic Iron & Steel Company's tube works in *The Iron Age* of January 5, 1911, reference was made to the new construction then under way and also forming a part of the company's Haselton plant at Youngstown, Ohio. This consisted of eight open-hearth furnaces, a blooming mill, continuous billet and sheet bar mills and a 500-ton blast furnace. In addition, a plate mill and a continuous merchant mill have been authorized, and work on both is well under way. The present article deals particularly with the open-hearth plant, the starting up of which, on June 12, marked the entrance in an important way upon the manufacture of open-hearth steel. Later articles will describe the new No. 4 blast furnace and the plate and merchant mills.

Fig. 1 is a general view of the open-hearth group of buildings, which are all on the left or east side of the picture, being bounded on the west by a steel viaduct

Fig. 1.—General View from the North of the Republic Iron & Steel Company's New Open Hearth Steel Plant at Haselton, Ohio.

which the company is building at a great outlay in return for the abandonment by the city of Youngstown of several streets which interfered with plans for future extensions of the works.

Arrangement of the Haselton Plant

The arrangement of the entire Haselton plant, including the blast furnaces, open-hearth works and the tube mills, is shown in Fig. 2, which indicates in dotted lines the proposed location of two additional blast furnaces.

The Brown-Bonnell works of the company, including its Bessemer plant and extensive billet, sheet bar and finishing mills, are entirely to the west of the Haselton site, and not far from the business center of Youngstown.

Plans were drawn for the Haselton steel works with a view to the best use of the property available and to permit of the future addition of four more open-hearth furnaces. It is also arranged so that two Bessemer converters can be installed between the mixer building and the open-hearth furnaces should the company decide to adopt the duplex process of making open-hearth steel. The property is 1¼ miles long. Between the open-hearth plant and the tube works, which is located at the extreme west end of the same property, is a space one-half mile in length which will be used for future finishing mills. A portion of this space has already been used for a plate mill and a continuous merchant mill. North of these latter and on the west side of the viaduct are the machine shop and boiler shop, as shown on the right in Fig. 1. The buildings comprising the steel plant are arranged parallel to each other and to the river, this being the plan adopted for the most economical use of the property. Beginning at the river side of the plant, Fig. 2, will be seen the stock house, and in line with it the calcining building, the two being connected by an overhead trestle which is used for delivering certain classes of material to these buildings. This is the only overhead track in the plant, if we except the approach to the charging floor and the hot metal track connecting the mixer building with the charging floor.

Open Hearth Furnaces

The open-hearth plant proper consists of eight furnaces of a rated capacity of 60 tons each, but of an actual capacity of 80 tons each, and already heats of 80 tons have been made. The furnaces are of unusually heavy construction. The steel ladles, which have a capacity of 80 tons, are handled by means of 125-ton ladle cranes. Both the charging floor and the pouring side, Fig. 3, are very wide, giving ample space for working, and the building is very high and well ventilated, this feature being given particular attention in order to make the conditions as comfortable as possible for the workmen. The pouring platforms are large, and are partly outside of the main building, so that the men can have ample light and air. In this building, as in all the others, escape platforms have been provided and every means taken to insure the safety of the workmen.

There are 16 automatic gas producers arranged in batteries of four, two to each furnace, connected to the furnaces by means of overhead gas mains. This method was adopted in order to overcome the danger from high water, which would have accompanied the use of underground flues. The furnaces also are set very high, so that the bottoms of the checker chambers are above possible high water. Coal is supplied for the gas producers by means of a bucket conveyor which hoists the coal into an overhead bin of 450 tons capacity. From this bin the coal is conveyed to each gas producer by means of an overhead larry car, a bin having a capacity sufficient for 24 hours' supply being provided over each producer.

Mixer and Pit Furnace Buildings

The mixer building contains one mixer of 400 tons capacity, and space is left for an additional mixer should this be necessary at some future time. Hot metal is brought from the blast furnaces across the Mahoning River, on a specially constructed bridge, in ladles of 35

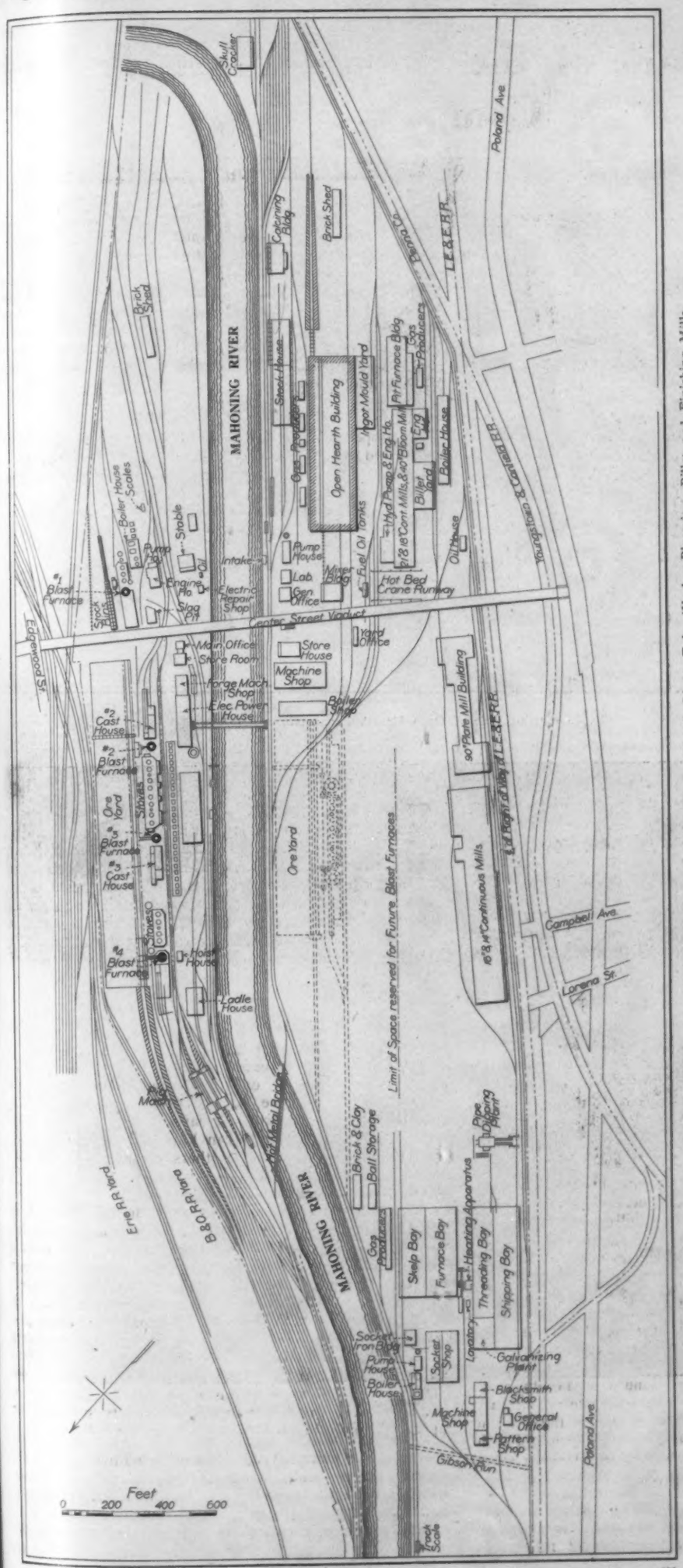


Fig. 2.—Plan of the Haselton Works, Including Blast Furnaces, Open Hearth Plant, Tube Works, Blooming, Billet and Finishing Mills.

tons capacity, and is poured into the mixer by means of a 75-ton crane. From the mixer it is conveyed to the furnaces by an electric locomotive attached to a 40-ton ladle car running on an overhead track which is level with the charging floor. For pouring the metal into the furnaces a 75-ton ladle crane is provided.

The pit furnace building contains four 4-hole pits, each hole having a capacity of six 20 x 24-in. ingots. In this building are an electric stripper of 150 tons capacity and 7½-ton charging and drawing cranes, all on the same runway. Space has been reserved for two additional soaking pits to be installed when the capacity of the plant requires it. Four automatic gas producers furnish the gas for the soaking pits, and the coal is handled by a bucket conveyor which delivers it into overhead bins.

Forty-Inch Blooming Mill

The blooming mill, Fig. 4, is of special and massive design, and embodies all the latest features applicable to a mill of this character, including a Wellman-Kennedy slab manipulator on each side of the rolls. The mill is driven by a pair of 44 and 76 x 60-in. horizontal tandem compound direct connected reversing engines, and is arranged for rolling 4-in. billets, blooms of all sizes and slabs 34 in. wide. Material rolled on this mill can be delivered direct to the 21-in. mill or else transferred by means of a rope transfer to a large slab shear, and from there delivered to the billet yard by means of chain conveyors.

Continuous Mills

The 21-in. continuous mill consists of four stands of 21-in. rolls which will take blooms of 42 sq. in. section and roll them into billets of about 3⅞ in. square for the 18-in. mill, also to the necessary section for making sheet bars on the 18-in. mill. The 18-in. continuous mill, Fig. 5, consists of six stands of 18-in. rolls. It will roll billets of from 1¾ in. square to 3 in. square section and sheet bars 8 in. wide of various

thicknesses. These mills are driven by one 48 and 84 x 60-in. horizontal cross compound condensing Corliss engine, by means of a long shaft and a set of bevel gears for each stand of rolls. A space of 150 ft. has been left between the 21-in. mill and the 18-in. mill, so that large billets can be taken from the former if desired. The material

high. The boilers are provided with mechanical stokers, super heaters and a continuous bucket conveyor for handling coal and ashes. Above each boiler is a coal bin with a capacity for 24 hours' supply. The whole installation has been made as complete as possible, and is an example of the highest type of steel works boiler plant.

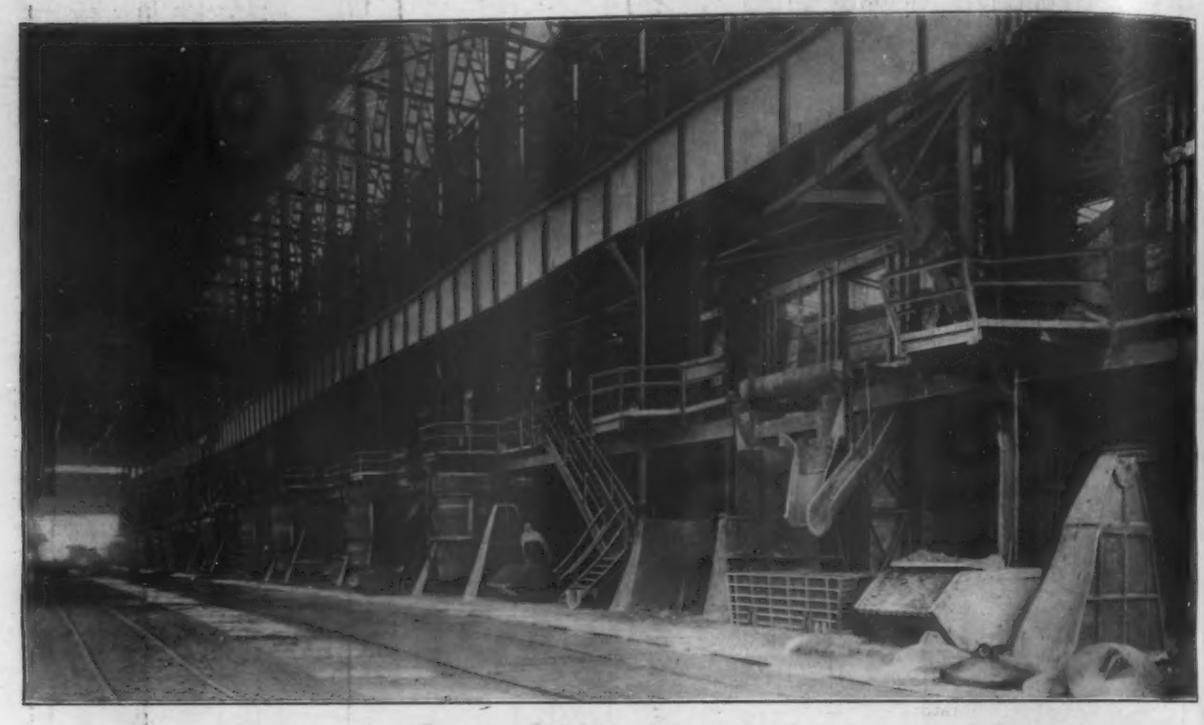


Fig. 3.—Casting Side of Open Hearth Furnaces.

Fig. 4.—The 40-Inch Blooming Mill.

from the 18-in. mill is delivered to a double cooling bed and from this loaded direct into cars by an overhead crane.

Power Plant

The boiler plant consists of 12 500-hp. boilers arranged in two batteries of six each, with one stack for each battery. The stacks are 10 ft. diameter inside and 250 ft.

Wherever possible electric power has been adopted for operating the machinery in connection with the plant, the electric power being supplied from the blast furnaces which are on the opposite side of the river. Hydraulic power is supplied by two cross compound engine type hydraulic pumps, each having a capacity of 1500 gal. per minute. Service water is supplied by three motor-driven

Fig 5.—The 18-Inch Continuous Billet and Sheet Bar Mill.

two-stage centrifugal pumps, each having a capacity of 7,000,000 gal. per day.

A very complete laboratory, machine shop, boiler and blacksmith shop and all necessary offices have been provided. It was the aim of the management to make the new works as complete and self-contained as possible, and no expense was omitted which would contribute to that end and to the maximum of economy in working. The plant was designed, built and organized by the operating and engineering departments of the Republic Iron & Steel Company, no outside engineer being employed.

New Tools and Appliances

This is essentially a news department for which information is invited.

A New Gap Lathe.—The Rahn-Larmon Co., Cincinnati, Ohio, has brought out a new type of electrically-driven gap lathe in which the motor is attached to the tool and the power transmitted directly to the spindle through gearing. To eliminate the vibration at high speed as far as possible the motor is mounted very close to the spindle, an arrangement which also enables the entire headstock and the change gears to be covered, thus protecting the operator. The starting and the stopping of the motor are controlled by a lever mounted at the right of the apron in a position convenient for the operator. In general the design of this new tool is such as to secure a rigid machine of simple construction. A hand wheel operating a coarse pitch screw enables the extension bed to be adjudged to any width of gap within the range of the lathe. Both of the beds are very heavy and the top one is accurately planed and fitted. The carriage is gibbed to the bed both in front and back and has a long continuous bearing. It can be firmly locked when using the cross feed and is so arranged that tool rest can be brought close up to the gap when necessary. An extension which is firmly braced on the front of the carriage provides extra travel for the tool rest so that the tool may operate on the largest diameter that can be swung in the gap. A large range of both longitudinal and cross feeds are obtained by shifting the change gear lever attached to the feed box, and the feeds are so arranged that no two can be engaged simultaneously. A safety device prevents the breaking of the feed box gears or those in the apron either because of accident or carelessness. Micrometer disks are furnished for the compound rest and the cross feed screws.

A New Chain Saw.—The International Endless Chain Saw Company, 34 University place, New York City, has built a line of sawing machines possessing a number of novel mechanical features. The saw blade frames of the smaller machines are balanced automatically by a sliding weight which keeps the parts in equilibrium at all times. The chain saw itself is made up of punched steel sections riveted together with teeth on one side and a guide on the other, the former bing spaced far enough apart to give clearance for the saw blade, which is made up of three pieces of flat steel riveted together so as to form a channel on each edge for the link guides to travel in. This chain is driven by a sprocket at the inner end of the blade and runs over another at the outer end, which is mounted on a tension device that keeps the chain taut at all times and yet provides the give required in a mechanism of this character.

Radiation Pyrometer.—The Thwing Instrument Company, Philadelphia, Pa., has recently developed a pyrometer, the operating principle of which is the measurement of the total energy of radiation by the current generated in a sensitive thermocouple by the radiation concentrated upon it. A conical mirror is employed for concentrating the radiation, and in fact, to do away with the loss of time required for focusing and eliminating the error due to inaccurate focusing. The galvanometer, while it does not require leveling, is nevertheless sufficiently sensitive to respond to the small current generated in the thermocouple by a difference of temperature which never exceeds 100 deg. C. A pivoted coil renders leveling unnecessary, and as light magnets are used the complete instrument weighs but 4 lb. and it is possible to carry it about from place to place easily. In action the pyrometer is said to be very rapid, responding instantly to temperature changes and reaching a state of equilibrium in 5 sec. after being pointed at the hot surface and returning as quickly to the zero position when the radiations are cut off. The instrument is especially adapted for measuring the temperatures in open-hearth furnaces and the range of temperature is unlimited in either direction.

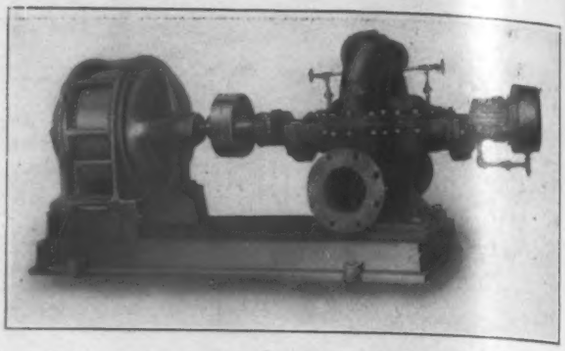
Combination Toolroom Furnace.—Tate, Jones & Co., Pittsburgh, Pa., have recently brought out a hardening furnace which is adapted for general toolroom work. The heating chamber is a cube measuring 6 in. on an edge, and is directly fired by a gas flame. For very delicate work a muffle can be inserted in the opening on the top, while for lead hardening and tempering or for case-hardening small parts a pot can be inserted.

Uncovering the Maine

Progress of the Notable Work in Havana Harbor

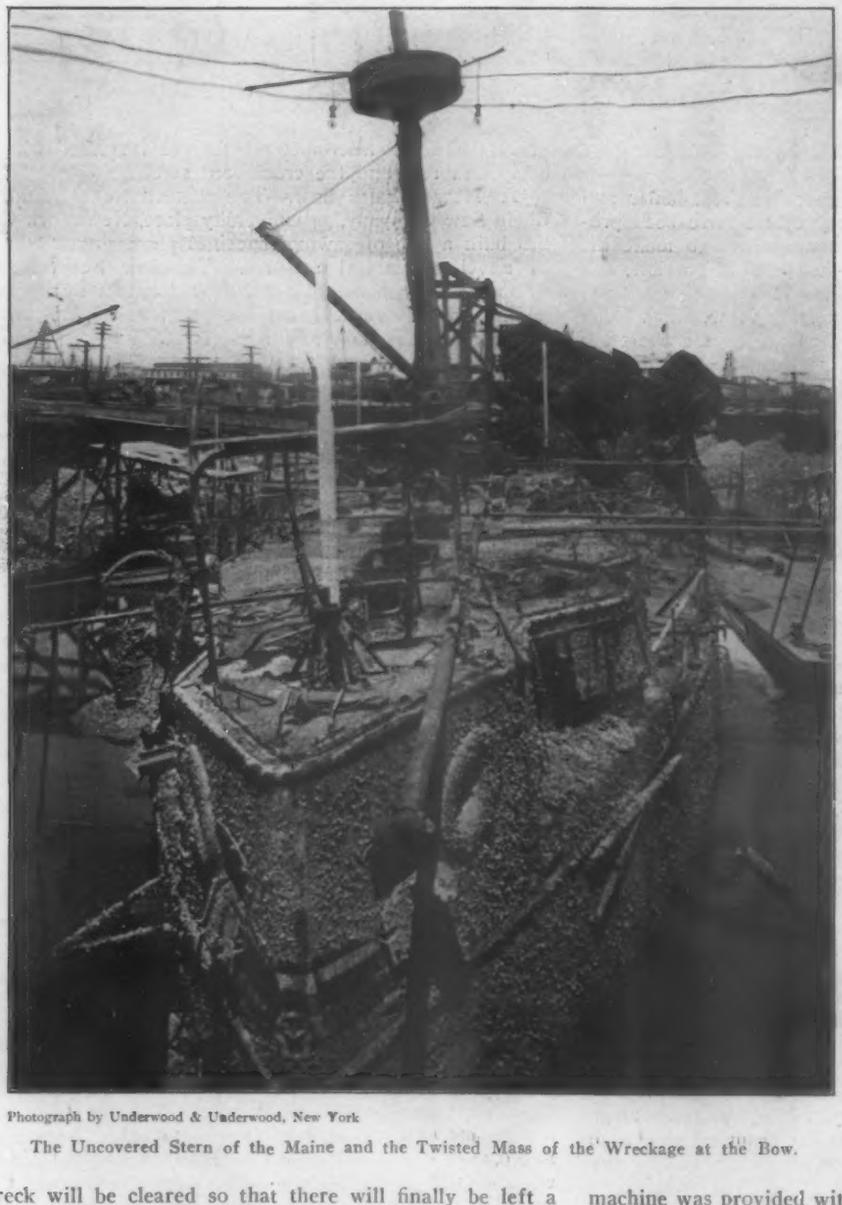
It will be noticed that the title avoids the expression "raising the Maine," for it has not been and never will be raised as an entirety. Present indications are that possibly the after part of the boat may be floated, but the forward half will have to be removed piecemeal, and perhaps the whole vessel will have to be cut up to get it out of the mud in which it is now held so fast. The remains of the wreck will be sunk with appropriate ceremonies somewhere out in the Atlantic Ocean where they will not be a menace to shipping. The steel foremast of the vessel weighs 10 tons and was shipped to New York June 13. The military mast may possibly be erected on the plot in the National Cemetery in Washington where the bones of the sailors who were lost in the disaster will be buried.

The cofferdam, comprising twenty steel cylinders each 50 ft. in diameter, formed of Lackawanna interlocking steel sheet piling, was described in *The Iron Age* of June 8. To insure the stability of the cofferdam, although there were no indications that serious fears were held concerning it, 20,000 tons of stone were deposited against its inner wall. At this writing, with about 34 ft. of water removed, there remains about 17 ft. of mud before the wreck will be cleared so that there will finally be left a wall 51 ft. high to resist a tremendous pressure from the water outside. The ship is 324 ft. long and the elliptical cofferdam which has been constructed around it has a major axis of 399 ft. and a minor axis of 219 ft. This is undoubtedly the first time that the cofferdam method has been applied to a similar purpose or on so large a scale.



One of the Jeanesville Pumping Units.

The pumping began June 6 and the next day the water had been lowered 5 ft. The pumping was continued at intervals with enough time left between the periods to allow the wall of the cofferdam to adjust itself to the increased strain upon it and allow any evidences of weakness to manifest themselves so that they might be corrected. Thus far the leakage has been insignificant and stopped without much effort. When the water had been lowered only 7 ft. it was apparent that the shattering of the hull of the battleship was far greater than had been supposed, the structure of the vessel being distorted, bent and crumpled to an almost unbelievable extent.



Photograph by Underwood & Underwood, New York

The Uncovered Stern of the Maine and the Twisted Mass of the Wreckage at the Bow.

July 18 the unwatering of the wreck was practically completed. At this writing the bow as far aft as frame 18 has been uncovered, permitting the study of the plates, beams, etc., and it was found that they originally belonged to the structure of the double bottom, which is now 40 ft. higher than its normal position, apparently confirming the truth of a tremendous exterior explosion. No authority, however, can be obtained from the engineers in charge to confirm this conclusion.

For removing the water within the cofferdam two large Jeanesville centrifugal pumps, driven by General Electric motors, were used. These pumps were built especially for the work and were sent out late in the year 1910 from the shops of the Jeanesville Iron Works Company at Hazleton, Pa. The largest machine has a 14-in. suction pipe opening and a 12-in. discharge pipe opening, and was designed to handle 4000 gal. per min. of Havana Harbor sea water against a 65-ft. maximum and a 5-ft. minimum head. The other machine had a 10-in. suction pipe opening and an 8-in. discharge pipe opening and was designed to handle 1800 gal. per min. of Havana Harbor sea water against a maximum head of 65 ft. and a minimum head of 5 ft. Each machine was provided with full complement of suction and discharge hose, strainers, valves, etc.

The main castings of the pumps were of a special grade of cast iron; the impellers of a special grade of bronze, and the shafts of steel, bronze covered. Each

pump is connected to its motor by a flexible coupling of pin-and-rubber-buffer type, the whole mounted on a common substantial cast-iron sub-base. The pumps are mounted on floats within the enclosure, the floats settling as the pumping proceeded and the current for operating the motors is obtained from a power house on shore transmitted through a cable. The above machines are what are technically known as Jeanesville double suction split casing pumps.

In the double suction pump the incoming fluid enters on both sides of the impeller and discharges from the impeller into a common vortex chamber. The casings and bushing boxes are split horizontally, which permits of ready access to all interior parts of the machine without breaking pipe joints or other connections and without disturbing the shafting or deranging the alignment of the pump and prime mover.

Although the water has been removed, the wreck has sunk so deeply into the mud that the keel of the Maine lies about 50 ft. below the level of the Havana Harbor. Probably 20 ft. of mud will be removed before the wreck is fully exposed. All of the ports were open when the vessel sank and the mud has settled in great quantities within the wreck. The only water inside of the cofferdam now is the overflow from the hydraulic pressure used to clean out the inside of the wreck.

Parts of the wreck which cannot be removed intact will be cut up by the use of oxy-acetylene torches. This apparatus has reached the site and has been set up inside the cofferdam.

The engineering work, superintended by Major H. B. Ferguson, taken as a whole, has been very successful in spite of the pessimistic predictions of those who maintained that the cofferdam method was impracticable.

The Ruggles-Coles Engineering Company, New York City, is to sell Monel metal castings in the United States and Canada for the Bayonne Casting Company. Monel metal is an alloy composed principally of nickel with some copper, iron and manganese, and has very high tensile strength. In external appearance it resembles pure nickel and takes the same finish. Its qualities make it well adapted for many purposes requiring a non-corrosive metal. In the form of sheets it is used for roofing, especially smelter roofs, and for skylights, boat sheathing, cooking utensils and chemical apparatus. As castings it is used in marine work for propellers, pump valves, cylinder linings and fittings subjected to superheated steam. Rolled into rods it is furnished for pump rods, steam turbine parts and electrical apparatus.

The Herman Pneumatic Machine Company, Zelienople, Pa., recently shipped to the Standard Car Company at Verona, Pa., a number of molding machines of new design.

A New Westinghouse Direct Current Motor

Excellent commutation and a highly efficient lubricating system are the features claimed by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., for a new direct-current motor intended for general power service. The new machine, which is known as the type SK, has a number of novel features and represents in many respects the most advanced design of direct-current motors. Fig. 1 is a view of the completed motor, while Fig. 2 shows the field frame.

The motor frame, which is of a new design, is illustrated in Fig. 2 and is made of a ring of open hearth steel hot rolled from the slab into shape and having the ends welded together. Rolled steel is regarded as an exceptionally good material for motor frames because of its high magnetic permeability, uniform structure and great strength. The feet are pressed from a steel plate and are riveted under pressure, calculated to give a rigid construction.

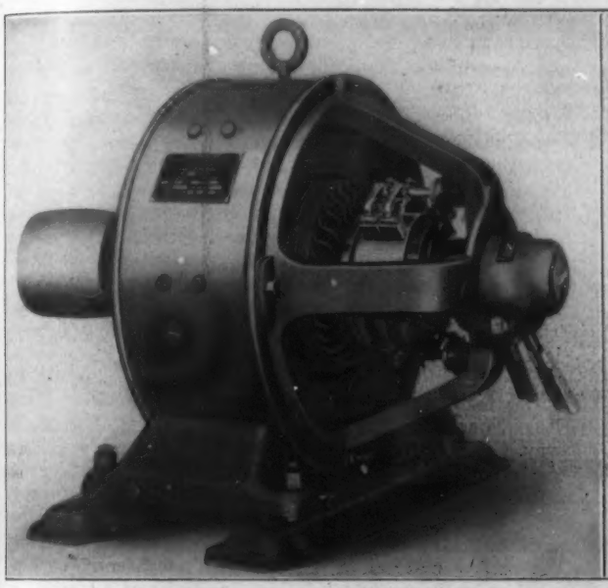


Fig. 1.—The Complete Motor.

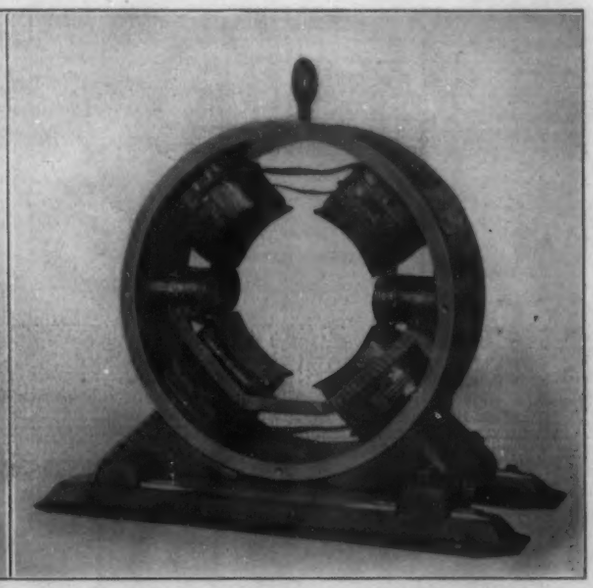


Fig. 2.—The Field Frame.

Two Views of the New Type S K Direct-Current Motor Built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

Practically sparkless commutation under all conditions of speed or load up to heaviest overloads which the motor will stand has, it is stated, been secured in tests made at the builder's shops. In winding the armature wide spaces are left between the ends of the coils and ventilating ducts are provided in the core. Form wound coils laid in open slots and held in place by fibre wedges and bands are used. If desired the shaft can be forced out of the armature without djstu'bing the windings and the commutator connections. The dust-proof bearing surfaces are lubricated by large oil rings while the motor is in operation.

These motors are built in a variety of sizes ranging from 1½ to 50 hp. and are wound for 115, 230 and 550 volts. The speeds correspond closely to the full load speeds on the company's induction motors, an arrangement which simplifies the application of the motors and makes changes from one type to another a comparatively easy matter.

The Gardner Convertible Gas Engine Company at Washington, Pa., has been purchased by B. D. Northrup, owner of the Northrup Machine Company, also of Washington, Pa.

The customs imports at Windsor, Ont., are increasing rapidly and if the present gain is maintained will aggregate $2,000,000 for the year. This is largely due to the American industries which have opened Canadian branches there this year.

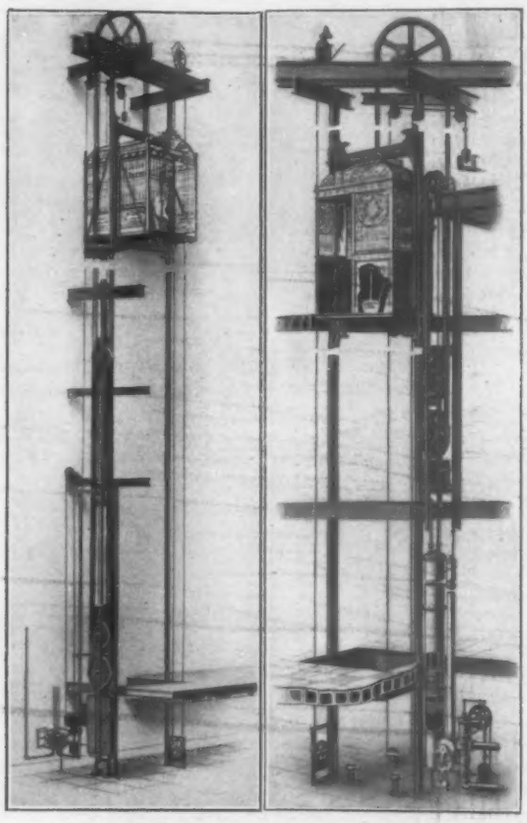
The American Duralumin Company, Hanover Bank Building, Nassau and Pine streets, New York, is distributing a paper cutter made of the new metal duralumin.

Modern Types of Elevators*

Their Characteristics and Fields of Usefulness

BY F. E. TOWN, PITTSBURGH, PA.†

The types of elevators most used today are the vertical-geared hydraulic, the direct-acting plunger elevator, the inverted-plunger elevator, the electric-drum machine, the worm-gear traction electric machine, and the gearless electric traction elevator. For many years the vertical-geared hydraulic elevator was used almost exclusively for high-speed, high-rise service; that is, for 20-story office buildings and the like. Some eight years ago the direct-plunger elevator became an active competitor in this field, and more recently still both have been largely supplanted by the gearless traction machine, which is the type of elevator used in the new Oliver Building.



Inverted Plungers. Vertical Geared.
Fig. 1. Two Types of Hydraulic Elevators.

The vertical-geared hydraulic machine—shown at the right of Fig. 1—consists essentially of a vertical cylinder placed either in the elevator hatchway or in a separate hatchway adjacent to it. This cylinder contains a piston connected by two piston rods passing through glands in the cylinder head to what is called the traveling sheave strap, to which are connected the counterweight and the necessary number of traveling sheaves. Directly above these traveling sheaves, at the proper hight in cylinder hatchway, are placed the required number of auxiliary sheaves. The cables start from a hitch near the auxiliary sheaves, pass down under the top traveling sheave, thence upward and over the bottom auxiliary sheave, then down again under the next traveling sheave, and so on, until after passing under the lowest traveling sheave they pass up over the overhead and down to the hitch on the car crosshead. The cable connections, therefore, correspond to the ordinary block and tackle, and a given movement of the piston moves the car a certain distance, depending on the gear ratio. For an office building of about 20 stories these machines are commonly geared 6:1, so that the piston travels only about one-sixth of the hight of the hatchway.

The water is usually supplied to these elevators from a pressure tank carrying about 160-lb. pressure, which is maintained by pumps pumping from a discharge tank directly into the pressure tank. The pressure tank is kept about one-third full of air to maintain, as nearly as possible, uniform pressure and cushion the pulsations due to the pumps. Water is admitted from a supply pipe to the elevator through an operating valve, which is controlled by a pilot valve connected by cable to the operating lever in the car. The movement of this operating lever opens either the supply or exhaust port of the pilot valve, and thereby causes the operation of the main valve, the direction of its motion depending on which port is open.

A rotary cut-off valve is placed in the discharge from the cylinder and operated by an arm on the traveling sheave strap to stop the machine automatically at the top and bottom limits of travel. By the use of the circulating pipe the cylinder is kept full of water above and below the piston, and this, connected to the circulating pipe, itself also full of water, maintains a constant head, so that there is no pressure variation due to the different hights of piston.

In the case of the direct-plunger elevator the cylinder is placed in the ground at the bottom of the hatchway, and a plunger, the full hight of the elevator travel, operates in this cylinder. The plunger itself does not touch the sides of the cylinder, but passes through a stuffing box in the cylinder head. Water is admitted to the cylinder at the cylinder head and discharged from the same point by a valve similar in general principle to that used for a vertical-cylinder machine. The pumping plant, the tanks, the piping, etc., are also about the same as would be required for other hydraulic elevators. Two separate cut-off valves are used, which are operated by long levers, the ends of which are connected to cables which pass diagonally up the hatchway. Small sheaves on the car, which travel along these cables, lift up the valve levers, one at the top and one at the bottom of the hatchway. The up-limit valve is placed in the supply line, and the down-limit in the discharge line, so that the car is automatically brought to a stop at the limits of travel. It is customary with all hydraulic elevators to place, in addition to the basement pressure tank, a pressure tank on the roof, connected to the basement tank by a standpipe, so that in the event of failure of air pressure from any cause there would still be a supply of water and sufficient pressure due to gravity to permit handling the elevators.

The inverted type of plunger elevator, illustrated at the left of Fig. 1, is not in such common use as the others. Its cylinder is placed in an inverted position in the hatchway, and the plunger, which passes through a stuffing box at the cylinder head at the lowest point of the cylinder, carries a traveling sheave strap and a counterweight similar to that used on the vertical-geared hydraulic. The car and the load are heavier than the plunger with its sheaves and counterweight, and tend to raise the plunger in the cylinder. The water when admitted under pressure forces the plunger down, thus raising the car. This elevator is used for high-water pressures of 750 to 850 lb. per square inch; and, instead of pressure tanks, accumulators are used to maintain a constant pressure of water. The pumps, the valves, etc., are of the high-pressure type, but the principle of the valve operation is the same as that of the other hydraulic apparatus. The pilot valves, however, operate on a separate pressure system at about 80 lb. to prevent excessive cutting due to the high pressure.

Electric Elevators

The electric-drum machine is in very general use over a wide range of duties, but is limited in speed to about 400 ft. per minute; in fact, for speeds of 300 to 400 ft. per minute the worm-gear traction machine is superior and is generally used if the rise is above 6 or 8 stories and not over 12 or 15. Where the travel is more than 12 or 15 stories and still higher speed becomes important the gearless-traction elevator is used. This machine is suitable for rises even higher than any for which elevators have been installed to-day, and for the highest permissible speeds.

The drum machine, Fig. 2, almost every one is familiar with. The car-hoisting cables and the machine counter-

*Extracts from informal address made before the Manufacturers and Contractors Club, April 11, 1911.

†Resident agent, Otis Elevator Company.

weight cables pass over a drum which is revolved by worms and gears. The worm shaft in turn is direct connected to the armature shaft of the motor driving the elevator. On the best types of this apparatus a switch is used in the car, connected electrically with magnets on the controller, which gives the operator control of the car as to starting and stopping and direction of movement. The controller, however, is so designed that the acceleration in starting and the retardation in stopping are controlled automatically.

The worm-gear traction machine, shown in Fig. 3, is similar to the drum machine, but has a traction sheave instead of a drum. The machine is commonly placed overhead and the cables pass from the car crosshead up over this traction sheave, thence down under an auxiliary sheave just below the traction sheave, then upward over the traction sheave a second time, and thence down to the counterweight. The auxiliary sheave is used merely to permit the double wrap over the traction sheave for the purpose of giving additional tractive effect. The control is similar to that used for the drum machine. A complete set of limit switches is placed at the top and one at the bottom of the hatchway, so that the car automatically cuts itself out at the top and bottom in the same manner the operator would by using the car switch. The counterweight carries an oil buffer, and an oil buffer is placed in the pit directly below the car, so that either car or counterweight would be brought to an easy and gradual stop from full speed if no other stopping devices were in operation.

The gearless or 1:1 traction machine is the latest, safest and most efficient elevator in use today. It consists of a large slow-speed motor, having a driving sheave connected directly to the armature and on the same shaft. The normal motor speed is 60 r.p.m., and the usual diameter of the traction sheave is such as to give a speed of about 600 ft. per minute to the car. The car is cabled exactly as described for the worm-gear traction machine. The entire machine is very heavy and substantial, and on account of the absence of gearing is extremely smooth in its operation. Further, as the armature speed is very low the period of acceleration is correspondingly short, and it is possible to start and stop these machines quicker than any other type; that is, it takes less time and a shorter distance of travel for the car to attain maximum speed, or to come to a stop from maximum speed. It can be readily understood that if either the car or the counterweight bottoms on the oil buffer the traction due to the pull of the cables on the traction sheave is reduced. Consequently, it is inherently impossible with this type of machine to pull either the car or the counterweight into the overhead work, a very important safety feature.

Safety of the Different Types

Regarding the safety of the different types of elevators, all, with the exception of the plunger, are provided with clamp safeties under the cars, operated by centrifugal governors usually placed at the top of the hatchway, so that excessive speed of the car in descending would cause

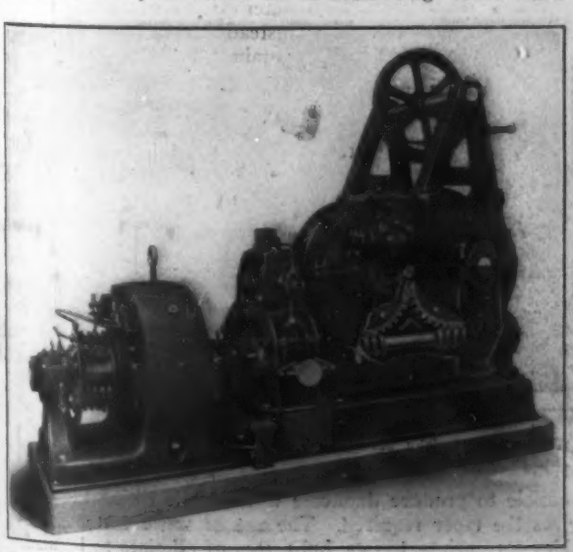


Fig. 2—A Double Screw Direct Current Machine with Switch Control.

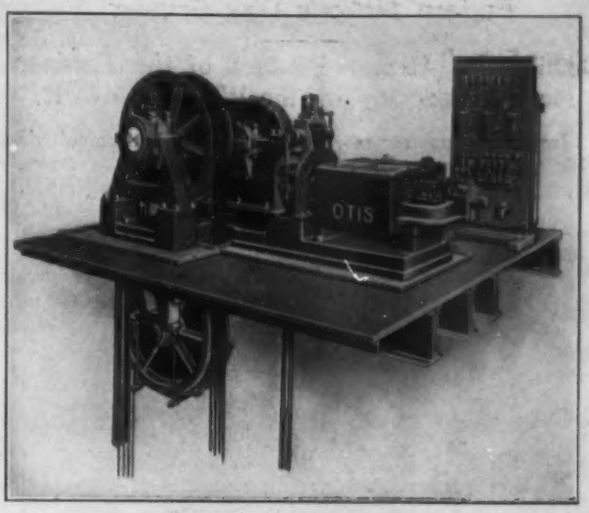


Fig. 3.—The Duplex Geared Traction Elevator with Overhead Type of Switch Control.

the governor to grip the governor cable and operate the safety, clamping the car to the guide rails. This prevents the possibility of falling due to breakage of hoisting ropes or of descending at a dangerous speed from some other cause. In the case of the plunger elevator it would not be possible to use a safety of this type, as the weight of the plunger would tear it loose from the car, if the car were stopped suddenly independently of the plunger. On the other hand, on account of the plunger running in a cylinder full of water below it, the car cannot descend faster than the water can escape, so that the guide grip safety is unnecessary. All hydraulic elevators excepting plungers can be provided with emergency levers in the cars, which permit the operator to throw on the safety by hand. The machines are also provided with limit stops to prevent overrun of the car at top and bottom, as before described.

The electric-drum machine, when used with switch control, as in Fig. 2, is provided with emergency switch in car, which permits the operator to open the potential switch and make an emergency stop. The machine is also provided with a stop-motion switch for stopping the car at the limits of travel, and in addition to this limit switches are placed at the top and the bottom of hatchway, which would stop the car in case the stop-motion switch on machine should fail.

The worm-gear traction machine meets all the safety requirements of the drum machine and has in addition the oil buffers heretofore described. It has also the advantage of loss of traction when either the car or the counterweight is blocked in descending. The gearless, or 1:1, traction machine is provided with all the safety devices known in elevator practice, including an emergency wheel in the car for operating the clamp safety.

The vertical-geared hydraulic elevator has given satisfactory service for years. The operation is good and maintenance and operating cost low. The plunger elevator came in vogue for high rise service partly because it was thought by many to be safer than other types, and partly because the plunger being directly under the car, no space in the hatchway is required for the cylinder, as in the case of the vertical-geared machine, and hence there is economy of floor space. The plunger elevator gives excellent results for moderate speeds and a rise, say, not over 8 or 10 stories, but for the modern skyscraper it has not proved as great a success as other types. It is impossible to get as short and smooth starting and stopping with it, and on account of this it would not make as many round trips and handle as many passengers in a given length of time as the geared hydraulic. The inverted plunger type is not in very general use, but in large hydraulic installations the high pressure and smaller volume of water result in keeping down the space required for piping, cylinders, etc., an obvious advantage.

The American Duralumin Company, Hanover Trust Building, Nassau and Pine streets, New York, is distributing a paper cutter made of the new metal duralumin.

Pattern Maker's Disk Grinder

Details of a Recent Product of the Gardner Machine Company and the Work Done by It

Improvements recently made in the patternmaker's disk grinder built by the Gardner Machine Company, Beloit, Wis., illustrated in *The Iron Age*, January 5, 1911,

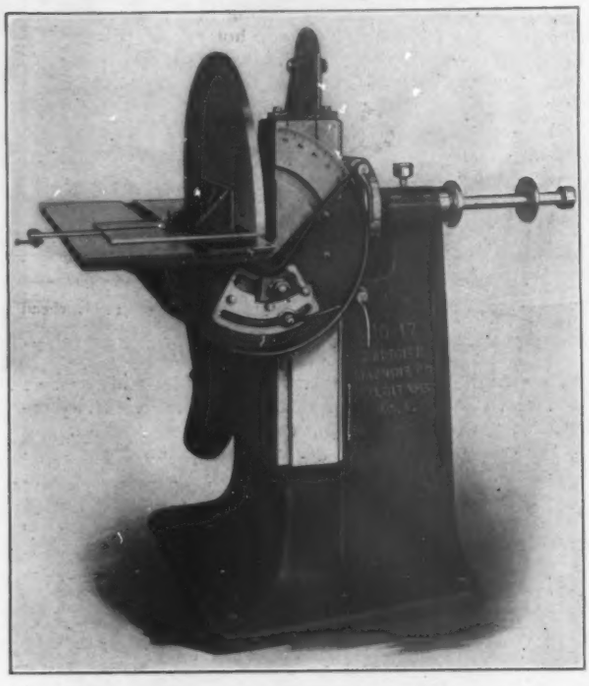


Fig. 1.—The No. 17 Pattern Maker's Grinder Built by the Gardner Machine Company, Beloit, Wis.

have resulted in the securing of a machine of the same promise in the woodworking field as the disk grinder has been in the metal working field. The equipment of this machine includes a universal work table, universal angle and duplicating gauges, a circular coreprint gauge, dust hood, countershaft and extra supplies. A view of the grinder equipped with a 30-in. disk wheel on one end and the universal duplicating gauge is given in Fig. 1, while Fig. 2 shows a special pattern that was recently produced by one of these machines.

The universal work table, which may be tilted to any angle with the face of the wheel, is one of the main features of the machine. One turn of the hand nut locks the table in the required position and the angle is indicated by the graduated segment at the right of the wheel. The design of the axis bearing, or tilting axis, is such that the inside edge of the work remains close to the face of the wheel regardless of its angular or lateral position. The entire weight of the work table is counterbalanced by a weight within the base of the machine. The weight is connected by a steel cable passing over a grooved pulley at the top. This arrangement enables the work table to be raised and lowered easily, and locked at the desired hight by turning the hand nut.

The universal duplicating gauge, which is illustrated in Fig. 1, is a convenient attachment for producing duplicate work. It is graduated from 0 to 45 deg. in either direction from parallel and an adjustable stop screw regulates the amount of stock removed. One of the special applications of this gauge is in the preparation of segments which can all be gotten out before the gluing operation is performed. It is also unnecessary to put the pattern on a lathe before attaching additional layers of segments, as they are all parallel and of the same thickness.

The universal angle gauge or protractor head furnished as a part of the grinder's equipment is a great convenience for squaring and producing angles and draught. It is graduated from 0 to 45 deg. in either direction and by using these graduations in conjunction with those on the head of the table any desired combination of angles can be quickly obtained. The guide bar can be adjusted so that when the table is tilted or the gauge is set at an angle the bar itself can be moved either to the right or the left, thus keeping one end close to the wheel. Like the mechanism of the work table, locking is secured by a single turn of a hand nut which simultaneously locks the guide bar in the required position and at the proper angle. The circular core print gauge is employed for producing round or curved surfaces. The work is pivoted on a pin driven in the gauge at the proper radius and is then swung or turned against the wheel. An adjustable stop screw regulates the amount of stock removed, and also makes it possible to produce duplicate work, while tilting the table gives the taper required. The use of this attachment enables core prints, bosses, hubs, etc., of all sizes to be made accurately and rapidly.

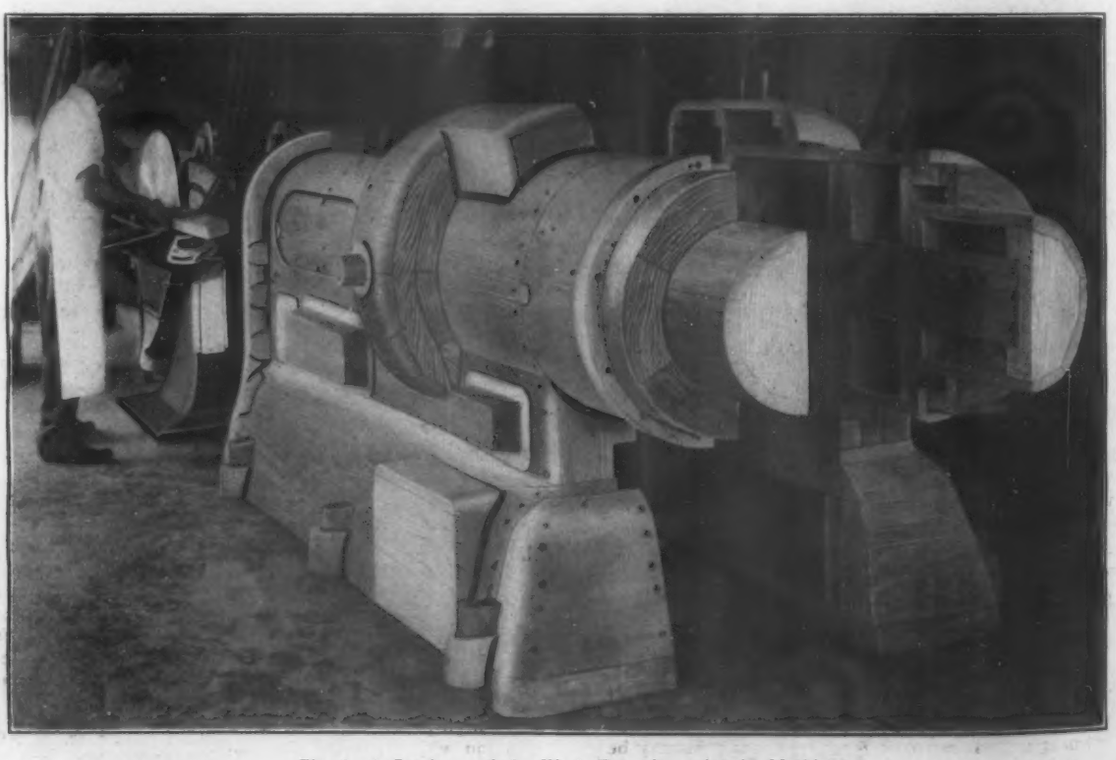


Fig. 2—A Specimen of the Work Turned out by the Machine.

The construction of the spindle is the same as that employed in the maker's No. 7 disk grinder, which was illustrated in *The Iron Age*, November 25, 1909. The spindle driving pulley is 10 in. in diameter with 5-in. face and 5 hp. is sufficient to drive the machine at a wheel speed of 6000 ft. per minute. Where this machine is used in the pattern shops the trimmer can be practically dispensed with, it is claimed, and in addition much lathe, band saw, jointer and drum sander work can be accomplished besides reducing the amount of hand planing, carving and sanding knots, cross and end grains in either soft or hard wood and projecting nails and screws can be worked without difficulty.

The pattern which is illustrated in Fig. 2 is that for the front, or cylinder, half of a 150-hp. gas engine ready for varnishing. The special features of the pattern worthy of note are the heads and the staves on the main core print as well as the segments further back. The cylinder and the base are both built up of staves and all the glue joints throughout the entire piece were not touched with a plane or any kind of tool or machine except the grinder at the left of the engraving. All of the core prints, no matter what their shape, including the large ones at the front end, were made entirely on the grinder and none of them were put into a lathe. The 3 x 8 in. hardwood pieces that anchor the heads together and stiffen the whole pattern were also ground to fit on this disk grinder.

Three sizes in all of this machine are built, which are known as the Nos. 16, 17 and 18. The first and the second are equipped with wheels on one end only, the diameter of the former being 24 in. and that of the latter 30 in. The No. 18 grinder is equipped with two 30-in. wheels, one mounted on each end.

Steel Reinforcement Bars

The Specification Proposed by the American Society for Testing Materials

The standard specifications for steel reinforcement bars in the slightly modified form in which it was ordered at the annual meeting of the American Society for Testing Materials, that they should be sent to the general membership for a mail vote, are here printed. They were compiled by Committee A-1, of the society, William R. Webster, chairman.

1. Steel may be made by either the open-hearth or Bessemer process. Bars shall be rolled from billets.

Chemical and Physical Properties

2. The chemical and physical properties shall conform to the following limits:

Properties Considered.	Structural Steel Grade—Plain Bars.	Structural Steel Grade—Deformed Bars.	Hard Grade*—Plain Bars.	Hard Grade*—Deformed Bars.	Cold-Twisted Bars.
Phosphorus, max.					
Bessemer	0.10	0.10	0.10	0.10	0.10
Open-Hearth	0.05	0.05	0.05	0.05	0.05
Ult. tensile strength, pounds per sq. in.	55,000-70,000	55,000-70,000	80,000 min.	80,000 min	Recorded only
Yield point, min., pounds per sq. in.	33,000	33,000	50,000	50,000	55,000
Elongation, min. per cent. in 8 ins.	1,400,000 tens. str.	1,250,000 tens. str.	1,200,000 tens. str.	1,000,000 tens. str.	5 per cent.
Cold bend without fracture:					
Bars under ¾ in. in diameter or thickness	180°d. = 1t.	180°d. = 1t.	180°d. = 3t.	180°d. = 4t.	180°d. = 2t.
Bars ¾ in. in diameter or thickness and over	180°d. = 1t.	180°d. = 2t.	90°d. = 3t.	90°d. = 4t.	180°d. = 3t.

*The hard grade will be used only when specified.

3. In order to determine if the material conforms to the chemical limitations prescribed in Paragraph 2 herein, analysis shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt or blow of steel, and a correct copy of such analysis shall be furnished to the engineer or his inspector.

4. Chemical determinations of the percentage of phosphorus, shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt of steel and a correct copy of such analysis shall be furnished to the engineer or his inspector. A check analysis may be made by the purchaser or his representative if desired, in which case an excess of 25 per cent. above the required limits will be allowed.

5. For the purposes of these specifications, the yield point shall be determined by careful observation of the drop of the beam of the testing machine, or by other equally accurate method.

6. (*a*) Tensile and bending test specimens may be cut from the bars as rolled, but tensile and bending test specimens of deformed bars may be planed or turned for a length of at least 9 in. if deemed necessary by the manufacturer in order to obtain uniform cross-section.

(*b*) Tensile and bending test specimens of cold-twisted bars shall be cut from the bars after twisting, and shall be tested in full size without further treatment, unless otherwise specified as in (*c*), in which case the conditions therein stipulated shall govern.

(*c*) If it is desired that the testing and acceptance for cold-twisted bars be made upon the hot-rolled bars before being twisted, the hot-rolled bars shall meet the requirements of the structural steel grade for plain bars shown in this specification.

Number of Tests

7. At least one tensile and one bending test shall be made from each melt of open-hearth steel rolled, and from each blow or lot of 10 tons of Bessemer steel rolled. In case bars differing ⅛ in. and more in diameter or thickness are rolled from one melt or blow, a test shall be made from the thickest and thinnest material rolled. Should either of these test specimens develop flaws, or should the tensile test specimen break outside of the middle third of its gauged length, it may be discarded and another test specimen substituted therefor. In case a tensile test specimen does not meet the specifications, an additional test may be made.

(*d*) The bending test may be made by pressure or by light blows.

8. For bars less than 7/16 in. and more than ¾ in. nominal diameter or thickness, the following modifications shall be made in the requirements for elongation:

(*e*) For each increase of ⅛-in. in diameter or thickness above ¾ in., a deduction of 1 shall be made from the specified percentage of elongation.

(*f*) For each decrease of 1/16 in. in diameter or thickness below 7/16 in., a deduction of 1 shall be made from the specified percentage of elongation.

(*g*) The above modifications in elongation shall not apply to cold-twisted bars.

9. Cold-twisted bars shall be twisted cold with one complete twist in a length equal to not more than twelve times the thickness of the bar.

10. Material shall be free from injurious seams, flaws, or cracks, and have a workmanlike finish.

11. Bars for reinforcement are subject to rejection if the actual weight of any lot varies more than 5 per cent. over or under the theoretical weight of that lot.

12. When an inspector is furnished by the purchaser to inspect material at the mills, he shall have full access, at all times, to all parts of mills where material to be inspected by him is being manufactured.

Lower Prices on Panama Rails.—The Canal Record of August 2 says concerning a recent purchase of open-hearth rails for Panama: "A contract for about one-half of the total amount of steel rail required for the track of the towing machines along the walls of the locks has been let to the Bethlehem Steel Company, the lowest bidder which offered open-hearth rail at $31.35 a ton. The amount of the contract is 1250 gross tons of 90-lb. steel rail, 85 per cent. in 30-ft. and 15 per cent. in 33-ft. lengths. The original bids were opened on May 10, but on account of high prices new bids were asked for, and foreign competition was invited. The second bids were opened on July 18, and the lowest prices offered were 50 cents per ton less for open hearth, and 35 cents per ton less for Bessemer rail. No bids were submitted by foreign manufacturers."

Radford Furnace, at Radford Furnace P. O., Va., which has long been idle, has been dismantled. It was built in 1868 and had an annual capacity of 4000 tons.

Republic Iron & Steel Company

Report for the Year Ending June 30, 1911—The Purchase of Steel Vessels

The twelfth annual report of the Republic Iron & Steel Company, which covers the fiscal year ending June 30, 1911, shows net profits of $3,008,934, as compared with $3,325,522 in the year preceding. The gross volume of business was considerably less than in the preceding year —$24,071,771 against $28,296,266—and the net profits were also reduced by an increase in fixed charges incident to building new steel works and a blast furnace which did not contribute to gross income, as they were not operated in the fiscal year. They are now running, however, and in the next six months a new sheared plate mill and a modern continuous mill will be in operation.

The report makes an announcement of special interest in the following. Details are not given as to the financial arrangements involved, but it is understood that bonds of the Republic Company were taken in payment for the vessel property:

"The Executive Committee has recently caused to be incorporated a steamship company known as the Republic Transportation Company, which will take over two modern steel steamships from the Federal Transportation Company and one modern steel steamship from the French Transportation Company, which consolidation of interests has been effected on a basis believed to be favorable to this company and will tend to establish its transportation interest on a more self-contained basis than has heretofore existed. This company will control the new transportation company through the ownership of 60 per cent. of the stock."

The balance sheet for June 30, 1911, is as follows:

ASSETS

Capital assets:		
Cost of properties July 1, 1910		$85,212,414.68
Additions for the year ending June 30, 1911		5,938,858.14
		$64,151,272.82
Investments:		
In Potter Ore Company	$401,000.00	
In other companies	529,852.09	930,852.09
Total capital assets		$65,082,124.91
Cash deposited with trustee:		
For redemption of first mortgage 5% gold bonds in addition to bonds of a par value of $2,139,000.00 retired in terms of the trust deed, per contra		48,495.76
Current assets:		
Inventory of manufactured products, material and supplies on hand at or below cost	$7,068,333.73	
Ore contract payments represented by ore at docks	686,254.79	
Accounts and bills receivable after deducting reserve for bad and doubtful accounts	3,245,775.42	
Cash	3,173,082.25	
Total current assets		14,173,446.19
Deferred charges to operations:		
Expenditure for stripping at Mines, advanced royalties, etc., chargeable to future operations		819,963.83
		$80,124,030.69
Net current assets	$10,729,102.80	

LIABILITIES

Capital stock:		
Common—273,520 shares of $100 each	$27,352,000.00	
Less—in treasury	161,000.00	$27,191,000.00
Preferred 7 per cent. cumulative—250,000 shares of $100 each		25,000,000.00
Total capital stock outstanding		$52,191,000.00
First mortgage 5 per cent. gold bonds:		
Total issue	$10,000,000.00	
Deduct—deposited with trustee and cancelled	2,139,000.00	
	$7,861,000.00	
Less—deposited with trustee of the 10-30-year 5 per cent. sinking fund bonds in exchange for bonds of that issue	6,206,000.00	
Balance outstanding	$1,655,000.00	
Less—purchased and held in treasury	10,000.00	1,645,000.00
10-30-Year 5 per cent. sinking fund mortgage gold bonds: (Total authorized issue, $25,000,000.00.)		
Total issued	$11,730,000.00	
Less—in treasury $681,000.00		
Purchased for sinking fund 294,000.00	975,000.00	10,755,000.00
Haselton property mortgage notes: (To retire which a like amount of 10-30-year bonds are reserved)		1,475,000.00
Potter Ore Company bonds:		
$641,000 outstanding first mortgage 5 per cent. bonds guaranteed jointly with Tennessee Coal, Iron & Railroad Company, less that company's proportion		320,500.00
Bonds and notes outstanding on the Martin Coke Works property		373,382.40
Funds:		
For exhaustion of minerals	$1,394,379.80	
For depreciation and renewal of plants	1,418,240.44	
For relining furnaces	257,118.07	
For fire and accident insurance	436,893.50	
For contingencies	114,937.24	3,621,569.05
Dividend warrants:		
Payable in equal annual installments from October 1, 1911, to 1915, inclusive		935,790.00
Current liabilities:		
Accounts and bills payable	$2,483,791.06	
Ore contract balances representing cash received in excess of the value of ore shipped to customers	210,801.23	
Taxes accrued	132,351.05	
Interest accrued	177,154.30	
Dividends payable: 1¾ per cent. on preferred stock payable July 1, 1911 $437,500.00		
Unclaimed dividends 2,745.75	440,245.75	
Total current liabilities		3,444,343.39
Surplus:		
Balance June 30, 1911, as per attached statement		5,362,445.85
		$80,124,030.69

Income for the Year

The income account and statement of surplus for the year are as below. The total of profits, $3,758,698, compares with $4,227,369 in the previous year, and with $2,769,147 in the year ending June 30, 1909:

Net earnings from operations, after deducting charges for maintenance and repairs of plants amounting to $1,313,162.25		$3,758,698.20
Interest and dividends received		86,302.12
Total profits for the year		$3,845,000.32
Less—Provision for depreciation and renewal of plants	$600,254.56	
Provision for exhaustion of minerals	235,811.34	836,065.90
Net profits for the year		$3,008,934.42
Deduct:		
Interest on bonds	$586,414.79	
Dividend on 7 per cent. cumulative preferred stock	1,750,000.00	2,336,414.79
Surplus for the year		$672,519.63
Add—Surplus at July 1, 1910		4,954,660.54
		$5,627,180.17
Deduct:		
Discount and expense in connection with the new issue of mortgage bonds		264,734.32
Net surplus carried to balance sheet		$5,362,445.85
Net profits applicable to dividends		2,422,519.63

New Record in Unfilled Orders

Chairman Topping says of the situation as to tonnage and prices:

"The slackening in sales and weakness in prices noted in the last annual report became more pronounced during the first half of this fiscal year, the calendar year 1910 closing with iron and steel markets much unsettled with production in most all classes on a steadily declining basis, low ebb being reached during the early part of May, 1911, at which time competition became decidedly aggressive, particularly for the commodities manufactured by this company. To meet this situation, substantial price reductions were made by this company, followed shortly thereafter by a general reduction in prices by all other manufacturers, covering most all lines of iron and steel, which action stimulated confidence in values and started a buying movement of sufficient proportions to enable us to place in operation the new open hearth steel works and Haselton blast furnace No. 4, recently completed, and also to continue satisfactory operations at the Bessemer steel works. The unfilled tonnage of orders on hand is in excess of that reported for the year preceding, and it is believed, with business booked and the tonnage now in prospect, that the gross volume for the coming year should be substantially increased. For comparison, the following figures of unfilled orders are submitted:

	Finished and Semi-finished, Net Tons.	Pig Iron, Gross Tons.
June 30, 1907	448,627	74,500
June 30, 1908	283,743	59,196
June 30, 1909	392,420	94,247
June 30, 1910	341,887	82,906
June 30, 1911	481,425	102,077

"In the totals of finished and semi-finished product nothing is included but fixed contracts; sliding scale contracts with periodical adjustments are excluded."

Additions to property account during the year aggregated $5,938,858. The new construction to June 30, 1911, in the northern district, amounted to $17,359,927, and in the southern district to $3,668,794, making a total of $21,028,721. The total of net working assets at the end of the fiscal year, $16,729,102, compares with $12,785,590, $7,809,901 and $6,713,820 for the fiscal years ending June 30, 1910, 1909 and 1908, respectively.

Condition of Properties

A review is given of the improvements of the year and the present status of plants, with comparative figures of production. A synopsis of this statement is as follows:

A new washer has been installed at Pioneer furnace No. 3, South, and a new hot blast stove has been authorized at Haselton furnace No. 1. The new blast furnace known as Haselton No. 4 was put in blast in June of this year. Comparative figures for pig iron production are as follows:

	Gross Tons.
Year ending June 30, 1907	614,954
Year ending June 30, 1908	494,676
Year ending June 30, 1909	678,799
Year ending June 30, 1910	793,962
Year ending June 30, 1911	850,863

The theoretical blast furnace capacity is 1,170,000 gross tons a year.

The production of Bessemer steel ingots in the year was 597,991 tons and of billets, slabs and sheet bars, 534,537 tons, against 681,884 and 606,531 tons, respectively in the preceding year. Work on the new open-hearth steel plant was actively presecuted during the year and it was put in operation in June 1911. At present it is operating to about 75 per cent. of capacity. Results so far indicate that the estimated full production of 30,000 tons of ingots per month will in a few months be exceeded.

The new 14-16-in. continuous bar mill authorized in the year will have a capacity of about 100,000 tons per annum of bars, structural material and skelp, the site chosen being adjacent to the company's new open-hearth plant. The new 90-in. sheared plate mill will have a capacity of about 5,500 tons per month and will provide sheared plates for the larger sizes of pipe which are being made in the company's tube works, as well as for the general trade. It is expected that the plate mill will be in operation in November, 1911. The annual production as given below shows a decrease on account of business conditions:

Annual Production of Finished and Semi-Finished Products.

	Gross Tons.
Year ending June 30, 1907	804,360
Year ending June 30, 1908	434,230
Year ending June 30, 1909	563,151
Year ending June 30, 1910	827,515
Year ending June 30, 1911	684,553

Raw Materials

An increase in the company's iron ore reserves has resulted from the exploration and development work of the year. At the Northern ore mines recent drilling has developed additional ore bodies at the Onondaga and Franklin mines. At the Kinney mine the old shaft has been abandoned because of its interference with stripping operations, and a new shaft is being sunk on an adjoining forty acres, leased for that purpose. At the Union mine, 50 per cent. of which is owned by the company, stripping operations have been continued, and by early winter the entire ore body will be stripped. At the Bray mine a new boiler house, machine shop and coal docks have been erected. At the Lillie mine a new shaft has been sunk to reach an ore body not available from the old shaft. At the Southern ore mines recent drilling at Tannehill and Houston mines has developed additional ore. At the Raimund division new tenement houses have been erected and the reconstruction work completed. As of June 30, 1911, there was in stock at the Pioneer furnaces, South, 25,000 tons of brown ore and 75,000 tons of red ore as a reserve supply to insure regular operations at these furnaces.

Iron ore production in the year was 1,861,185 tons, against 2,059,224 tons in 1910, 1,451,434 tons in 1909, 1,025,460 tons in 1908 and 947,069 tons in 1907. The ore reserves in the North are put at 38,812,467 tons and in the South at 127,471,048 tons.

At the Northern coke properties 50 new ovens were added. The coke production for the year, 723,859 tons, was the largest in the company's history, comparing with 670,018 tons in the previous year. The total number of ovens in the North is 784 and in the South 1010, the capacity of the former being 548,800 tons and of the latter 606,000 tons. The estimated coal reserves June 30, 1911, were 88,797,475 tons in the North, against 89,238,716 tons one year previous, and 32,484,030 tons in the South, against 74,792,690 tons in the previous year. The large falling off is due to the fact that a considerable acreage in the South, heretofore estimated to contain coal, was found on actual drilling to contain no coal of a workable character.

Limestone production was 88,239 tons in 1911, against 115,473 tons in 1910. Limestone reserves are around 31,000,000 tons, as they have been for several years. The average number of men employed at all works last year was 11,588, against 12,066 in 1910, 8340 in 1909, 8547 in 1908 and 13,895 in 1907. The total expended for labor was $8,273,630, against $8,652,102 in 1910.

Pittsburgh and the Steel Corporation

President James A. Farrell, of the United States Steel Corporation, was in Pittsburgh last week inspecting various plants of the Carnegie Steel Company. He visited the Homestead steel works and the Edgar Thomson steel works on Thursday, August 10, the Duquesne steel works and the National tube works at McKeesport on Friday and the Schoen steel wheel works and the Bessemer & Lake Erie Railroad on Saturday.

While in Pittsburgh Mr. Farrell gave out an interview in which he said that having been a worker in the steel industry of Pittsburgh for many years he had a deep interest in all that pertains to it. While in some quarters there had been a disposition to depreciate the future of Pittsburgh as a steel-producing center, he said that the increase in capacity of the Carnegie Steel Company alone is equal to the capacity of the Steel Corporation's works at Gary. "This country is great enough to support several large producing centers and it is natural that as the trade and population of the country extend westward and southward Chicago, Gary, Duluth and Birmingham should each have a measure of importance, leaving the great and growing East and Central West and the worldwide markets as the consuming field for the Pittsburgh district. Not only is Pittsburgh located to satisfy the great demands of its contiguous territory but it may look forward to an increasing foreign business, the extent of which may be conjectured from the fact that the United States Steel Corporation is now approaching 2,000,000 tons of exports annually, all of which is produced in its mills in Pittsburgh and vicinity."

Particularly significant is Mr. Farrell's statement below that since he has been president of the corporation, or since January 1 of this year, about $750,000 has been spent for safety devices and in welfare work:

It has been my duty and pleasure to investigate and recommend to the Steel Corporation for favorable consideration a number of important appropriations for the betterment and extension of its plants, aside from some $750,000 for the installation of safety appliances and extension of welfare work for the benefit of our employees, and I am pleased to state that these appropriations have been approved with cheerfulness, as, notwithstanding the numerous claims for consideration, it is recognized that our Pittsburgh industries must be developed to the highest state of efficiency. Proposals from time to time are under consideration which, when carried out, will add still further to the effectiveness of its plants, increased capacity and diversity of its product and for the improvement of social and economic relations with its employees.

Referring to the warehouses established at Pittsburgh, Waverly and Cleveland and those to be established at San Francisco, Baltimore and in foreign countries Mr. Farrell said that these would afford outlets for the proper distribution of product without taxing the mills with small, difficult and urgent specifications. The requirements of these warehouses will be supplied to a large extent from the Pittsburgh district.

There is a great future for our Pittsburg industries, and it is with the intention of investigating personally, so far as possible within a limited time, its facilities, the future needs of its plants and other conditions such as affect raw materials and their transportation, that I am here to make the necessary inquiries and observations in advance of a careful study, which will serve to supplement the recommendation of our officials. We cordially endorse the theory that it is not only our duty from a humane standpoint, and in acknowledgment of the rights and privileges of our fellow men, but also good business practice to make a close and continual study of the conditions under which all of our employees live and labor, and to improve those conditions so far as they can be improved consistent with natural environments. Much has been and is being accomplished in this direction.

A Special Langelier Drill

A Recently Developed Tool for Drilling Meat Cutter Plates.

For drilling the holes which regulate the size of the finished product in meat choppers the Langelier Mfg. Company, Providence, R. I., has adapted one of its larger size

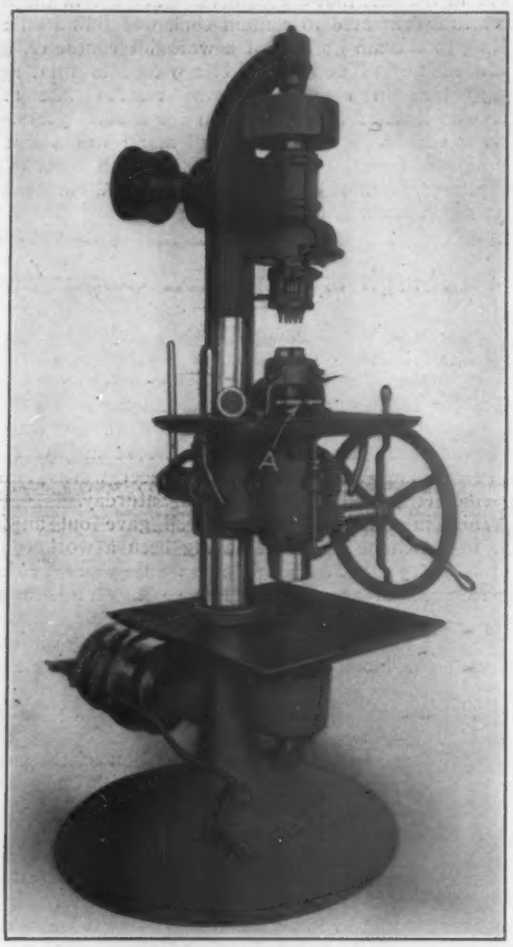


Fig. 1.—A Multiple Spindle Drill Equipped for Drilling Holes in Meat Cutter Plates Built by the Langelier Mfg. Company, Providence, R. I.

multiple drilling machines of the raising-table type. This tool was equipped with six interchangeable drilling heads, each having a different spindle layout and a table fixture for locating, holding and indexing the plates while the holes were being drilled. While the distance between the holes in all these plates was approximately 1 1/3 times the diameter of the drills used, it was not considered possible to design a spindle which would complete the work in any one plate in a single operation. Another serious disadvantage even if such a construction were possible was the clogging up of the drills with stringy steel chips. Fig. 1 is a general view of the drilling machine employed for doing this work, while Figs. 2 and 3 show a typical set of plates drilled and the special drilling heads employed to do this work, respectively.

The rows of holes in the plates shown in Fig. 2 were arranged on either circular, polygonal or involute lines, and considerable ingenuity had to be exercised to arrange a layout of drilling spindles which would do the work in the least possible number of operations. This was especially true where the number of holes in any one row was odd, and it was recommended that the manufacturers of these plates design the holes so that the number in each row will be even. The following table gives the number of holes in each of the plates illustrated in Fig. 2, together with the number of spindles employed and the number of operations.

Plate.	No. of holes	No. of spindles.	No. of operations.
A	40	8	6
B	50	10	5
C	102	17	6
D	78	12	7
E	80	16	5
F	144	36	4

Five of the six interchangeable drilling heads are shown in Fig. 3; the sixth one being illustrated in Fig. 1, in position on the drilling machine with a steady jig attached. These heads are all self-contained and are easily and quickly interchanged by using the four-leg cradles furnished with the heads for safe keeping when not in use. Phosphor bronze was employed for the heads and spindle drivers and the drilling spindle holes are bored to within 0.0005 in. of their proper location. The drilling spindles, which are of tool steel, are cut from the solid bar and hardened, tempered and ground. They are fitted with pinch chucks for taking straight-shank wire twist drills.

The main driving spindle, which is 1 5/16 in. in diameter, runs in loose perforated bushings in both the upper and the lower bearings, thus increasing its resistance to wear and to becoming heated from the high speed at which it runs. All the parts connected to this spindle and running at high speed are lubricated through a capped brass oiler screwed into the upper end of the main spindle. On this oiler the lubricant flows down through a hole extending the entire length of the main spindle to the drilling head. The influence of gravity and centrifugal force lubricates both the upper and the lower spendle bearings, although in the case of the former dependence is not placed upon this method alone, a separate oil well being provided for it.

The table used with this drill has a working surface of 12½ x 20 in., with an oil trough on all sides having an outlet on each end leading to the oil pan beneath. A feed of 9 in. is provided, which is controlled by an 18-in. hand wheel through a pair of gears and pinion and rack, which increase the ratio of the table feed leverage to 30 to 1. A stop screw enables accurate duplication of the depth of

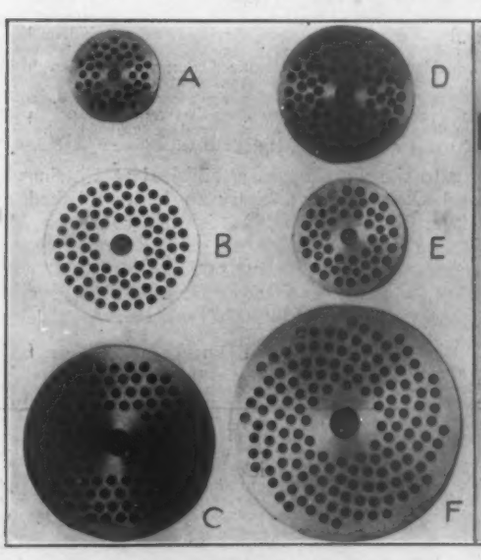


Fig. 2.—A Typical Set of Plates.

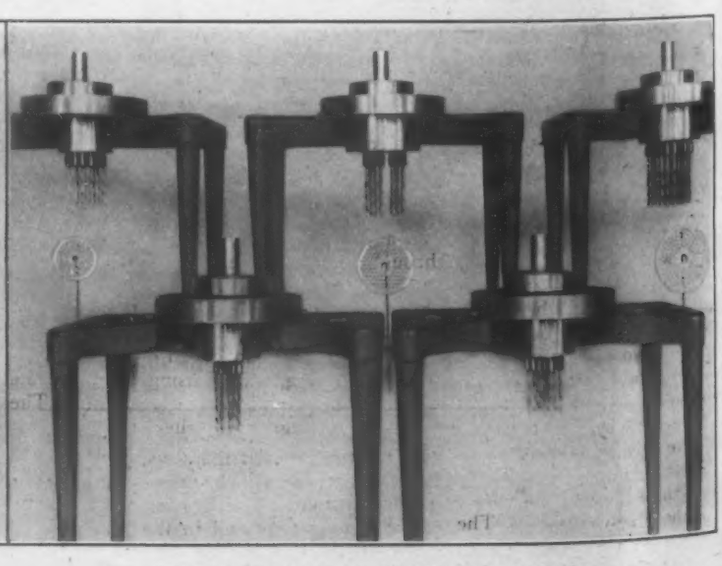


Fig. 3.—Some of the Special Drilling Heads Used.

holes to be procured. The arm supporting the table is adjustable, and its movement is controlled by a ratchet-pawl and a rack and pinion mechanism located on the left side of the machine. The distance from the lowest position of the table to the end of the drills is 10 in., and the supporting arm for the table can be clamped in any convenient position required. The distance from the main spindle center of the table to the outside of the column is 6⅞ in. In Fig. 1 a cutter plate fixture and a drilling steady jig are shown. The former is centrally located with reference to the drilling head, and is fastened by screws to the table. The functions of this fixture are locating, holding and indexing the cutter plate, which is seated on three short steel posts in the indexing head, while an expanding arbor projecting above the top face of this head locates the plate centrally with reference to the drilling head, and holds it in position. Individual indexing heads and expanding arbors are required for each plate and are quickly and easily interchanged. The indexing head is moved down by hand and is locked in position by a locking pin actuated by a downward pressure on the small lever at the right of the fixture, while the arbor is expanded by turning the small hand wheel A, Fig. 1, which has the spokes carried through the rim. The other fixture is clamped to the lower end of the drill head, and is adjustable in the vertical plane to permit the cutting end of the drill to project sufficiently to drill through the plate. This jig is used on the four smaller sizes of heads, and the only change that is required is the removal of the steel plate containing the jig bushings, which are held in place in the lower opening of the steady jig by screws and the substitution of another.

The drills are supplied with cutting oil by an oil pump, and after being used this oil flows into the lower oil pan and is filtered twice before entering the supply oil tank to be used again. The pump supplying the oil to the drill is located on the base of the machine at the right side.

The machine is belt driven, the driving shaft with the tight and loose pulleys being located on the base of the machine. This shaft is of the trunnion type driven into a hub on the base, and all the pulleys are fitted with loose perforated bushings. A foot belt shifter controls the starting and the stopping of the drill.

The following table gives the principal dimensions and specifications of the machine:

Working surface of table, in.	12½ x 20
Length of table feed, in.	9
Maximum distance between table and drill, in.	10
Diameter of main driving spindle, in.	1 5/16
Distance between main spindle center of table and inner face of column, in.	6⅞
Speed of spindles, r.p.m.	800
Floor space required, in.	33 x 42
Overall hight, in.	80
Net weight, lb.	1750
Domestic shipping weight, lb.	1950
Foreign shipping weight, lb.	2494

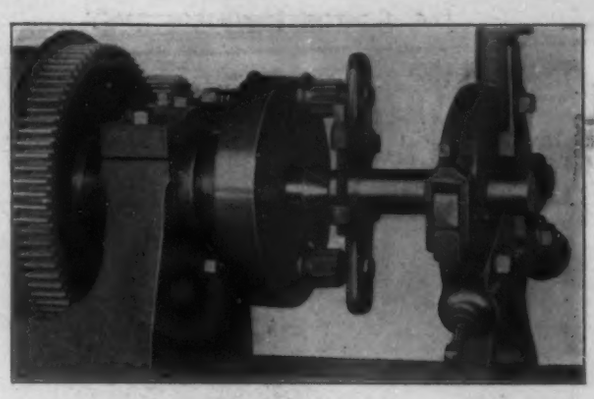
Other drilling heads with different spindle layouts which can be arranged within a 5-in. circle can also be used in this machine. The drill head casing can be removed if desired and another casing substituted to accommodate larger heads where the layout of the spindles is not larger than an 11-in. circle.

The Hill Face Plate Dog

As a substitute for belt lacing or a hook bolt to hold work against the headstock center of a lathe while the other end of the piece is running in a steady rest, the M. B. Hill Mfg. Company, Worcester, Mass., has brought out a holdback and faceplate dog.

The device consists of an adjustable dog or driver and two bolts which pass through the face plate. Spiral springs which are shown back of the face plate are mounted on these bolts and give the flexibility of the lacing. The bolts, which need only be set once, hold the work as securely as a hook bolt and can be adjusted to draw equally on both ends of the dog, thus causing the work to run true in the rest.

In use, the bolts are first put through from the back of the face plate and screwed into the threaded sleeves for three turns. The dog is then tightened on the work and the bolts screwed in so as to compress the springs to half their length. The fluted nuts on the opposite side of the face plate prevent the springs from pulling the dog back and should be set up tight against the face plate when



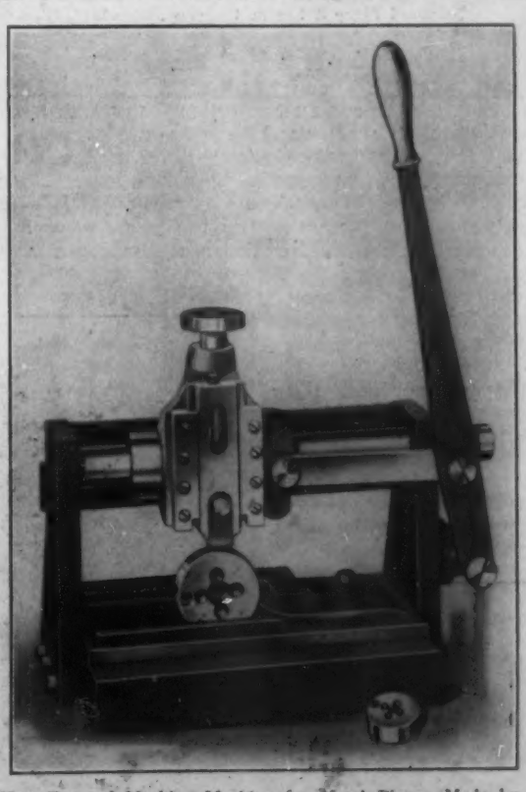
A Holdback and Face Plate Dog for Lathe Work Made by the M. B. Hill Mfg. Company, Worcester, Mass.

the dog is to be loosened and run back after the dog has been tightened on the work.

The attachment, which is said to be positive in action and more easily operated than the ordinary way, is made in two sizes. The smaller one will accommodate work from ½ to 2 in. in diameter while pieces between 1 and 3½ in. are cared for by the larger size.

The Remington Marking Machine

For the marking of tools and other small pieces which was formerly done by hand with a set of steel stamps, the Remington Tool & Machine Company, 50 Congress street, Boston, Mass., has placed on the market a simple form of marking machine. This new device is adapted for straight stamps for round work and circular stamps for flat work and is designed to give a uniform impression and to eliminate the breakage of the steel stamps



A New Type of Marking Machine for Metal Pieces Made by the Remington Machine & Tool Company, Boston, Mass.

employed as there is practically no injury to the face of the stamp used.

The stamp is attached to a slide which in turn is mounted on a head that is moved horizontally by the lever shown at the right of the accompanying engraving. To compensate for varying thicknesses of the stock being stamped means for quick vertical adjustment is provided for the head, while an automatic stop regulates the horizontal movement. The capacity of the machine is 1800 pieces per hour.

New Standard Pumps

Details of a General Line of Motor-Driven Machines

A new line of motor-driven pumps for all kinds of water supply systems has recently been brought out by

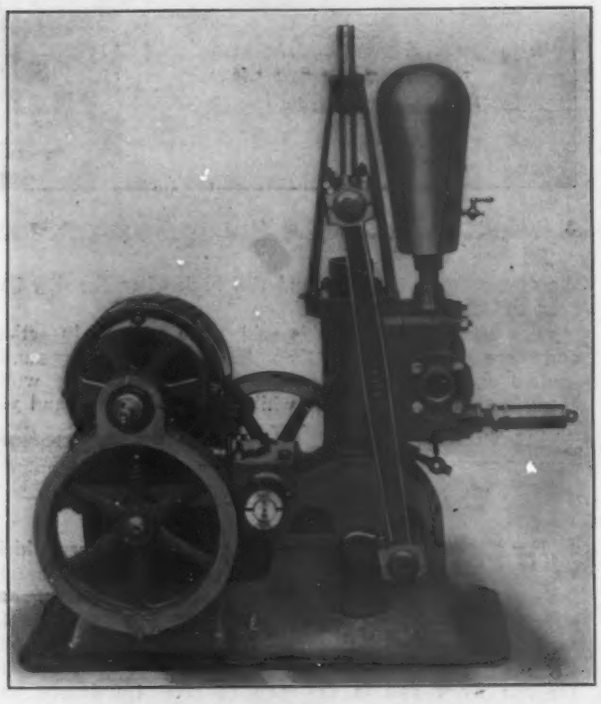


Fig. 1.—A New Motor-Driven Suction Lift Pump Built by the Standard Pump & Engine Company, Cleveland, Ohio.

the Standard Pump & Engine Company, Cleveland, Ohio. These pumps are designated as the Standard electric pumps. One type is a 1-hp. suction lift or deep well pump with the electric motor and the pump mounted on one base. This pump is of the double-acting differential cylinder type, which does away with stuffing boxes and inaccessible pump valves. Practically no change in mechanism is necessary to convert this from a suction lift to a deep well pump, the only change required being the taking out of the suction lift flange and substituting in its place a drop pipe flange for holding the pipe which is lowered into the well. The capacity of this pump is 400 gal. per hour against any pressure up to 90 lb. This pump may be used in connection with the water supply systems made by the company.

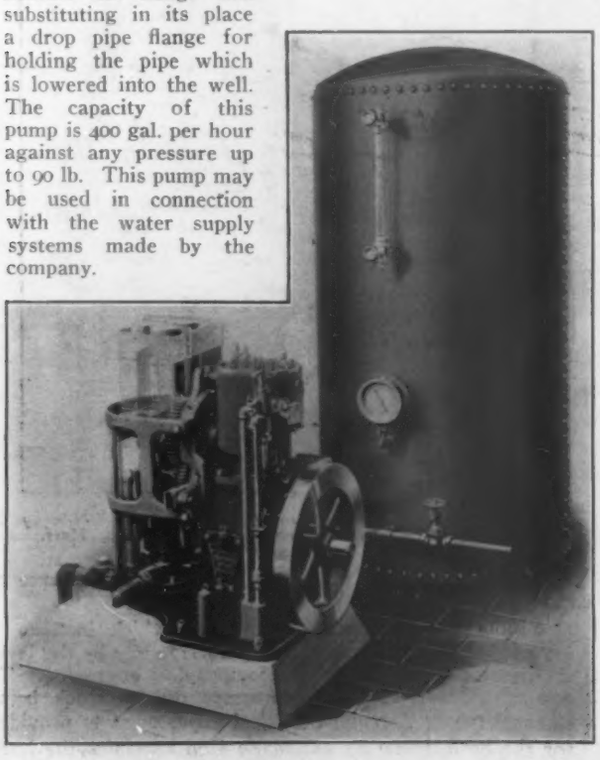


Fig. 2.—The Standard Jr. Pump Equipped with a Water Supply Tank.

This company has also brought out a 2 and 5 hp. motor-driven suction lift pump, shown in Fig. 1. This has a capacity of from 800 to 4000 gal. per hour against a 90-lb. pressure. The pump section in this machine is identical to that used in the 2 and 5 hp. gas engine driven pumps made by the company. The motor is so arranged that the pump may be disengaged and the motor used for power purposes without operating the pump. The pump is of the double-acting valve chamber type.

Another new type is the Standard 2 and 5 hp. motor-driven deep well pump. The capacity, pump section and the motor mounting are the same as in the 2 and 5 hp. suction lift pump referred to above. All of the Standard deep well pumps are designed with differential cylinders so that the load is divided between the up and the down stroke, making it possible to deliver water with an even flow against high pressure, so that the pumps can be used for spraying and irrigating, in greenhouses and on truck farms without storage tanks. All of this company's pumping outfits are fitted with air compressor attachments when used in connection with pneumatic water supply systems.

In the electrically-driven pumps the motor is mounted on the base in place of a gas or gasoline engine and the gearing is so arranged that any type of make of motor may be used according to the electric current available.

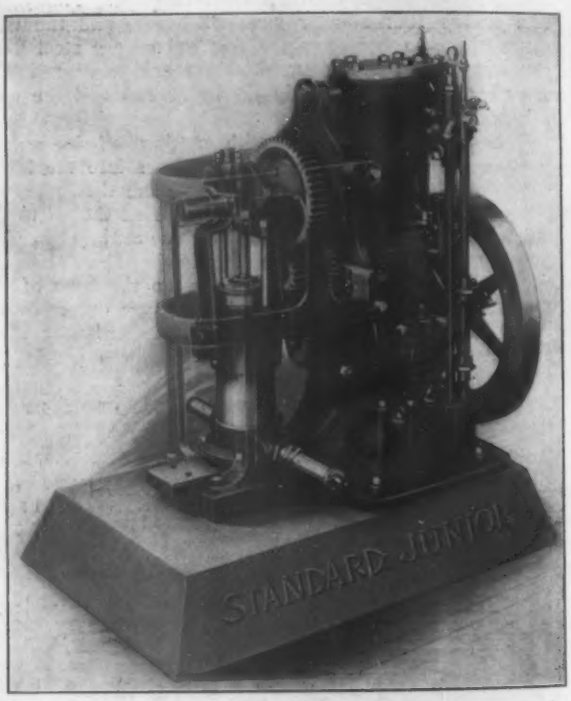


Fig. 3.—The Standard Jr. Pump.

The motor is supplied with a noiseless pinion which meshes with a larger gear on the reduction shaft, the small gear of which drives into the pump crank gear and in that way imparts an even powerful motion to the pump piston. An automatic cut-out switch starts and stops the pump according to the pressure. These pumps are designed for pumping into pneumatic water supply tanks, elevated storage tanks or for direct pressure into the pipe line.

The company has also brought out a new gas or gasoline pump. This pump, which is designated as the Standard, Jr., is made in the suction lift and the deep well types. This pump with and without water supply tank is shown in Figs. 2 and 3 respectively. The engine is the same size as in the 2-hp. pump but the pump itself is smaller, which permits of some modification in the design. One new feature is that the stuffing boxes, which sometimes leak and cause trouble, are entirely eliminated. Another new feature is an automatic safety valve by which the engine can be stopped at any pressure to which it is adjusted from 10 to 90 lb. per square inch. There is a gasoline tank in the base, with all pipes cut and fitted, this being another new feature. The pump is double acting of the differential cylinder type, which insures a steady flow of water. It is constructed in such a way

that the entire pump can be opened for cleaning or inspection by simply removing four screws. The cylinder is brass lined and is fitted with brass pistons and hydraulic packing. It has a disengaging device so that the engine can be used for other purposes without operating the pump. This pump has a capacity of 400 gal. per hour against any pressure up to 90 lb. per square inch. Both types are supplied with air compressor attachments when used for pneumatic water supply systems. This pump is

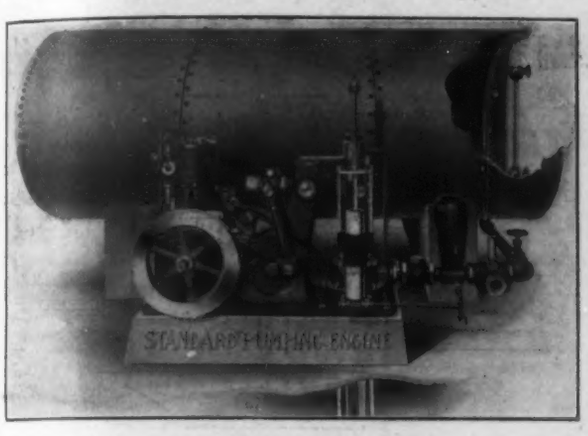


Fig. 4.—A Gas Engine Driven Deep Well Outfit.

designed especially for small water supply systems for suburban residences and farm houses. It is very compact, being 18 x 20 in. in size at the base and 28 in. high. It weighs 500 lb.

Another new type is a gas or gasoline engine driven deep well pump made in 2 and 5 hp. sizes, which is shown in Fig. 4. This differs from the company's other 2 and 5 hp. gas and gasoline engine pumps in that it has an air pump attachment for supplying air with water for a pressure tank system.

The Youngstown Sheet & Tube Company's Profit Sharing Plan

Under date of August 10, 1911, the Youngstown Sheet & Tube Company, Youngstown, Ohio, issued the following statement to its employees concerning the working of its system of profit distribution. It is signed by W. C. Reilly, general superintendent:

June 30 marked the end of the company's second year under a profit-sharing plan. While the earnings of the company for the fiscal year ending June 30, 1911, were less than 60 per cent. as large as in the preceding year, the directors, desiring to show their appreciation of the efforts of the employees, have decided to disregard the reduction in the company's earnings and pay the same percentage as last year. On August 19, therefore, employees entitled to participate will receive as a share of the company's profits for the year ending June 30, 1911, a sum equal to 5 per cent. of the wages paid them by the company during that year.

The company is now entering its third year of profit-sharing, and it seems fitting at this time to consider just what profit-sharing means. It means, above everything else, that the employees have an interest in the prosperity of the company. It means that the greater the company's success the more its employees receive for their year's work. It means that when an employee saves the company money he gets for himself a portion of the money so saved. It means that in addition to the regular wages for work a cash premium for ability and loyalty is paid. It is a substantial proof of the statement that the interests of the employees and the company's interests are the same.

When the company started this profit-sharing plan it had great hopes that it would be a success in many ways. The company was paying, as it always has, as high wages as any of its competitors, and it was felt that in offering a share of the profits as well it would go far in making its plant a desirable place in which to work. It was in hopes the new plan would encourage employees to be careful not to cause the company expense through needless spoiling or wasting of tools, supplies or product, because such expense reduces the total profit, and hence the share of the employees. The hope was, in a word, that the new plan would bring the company and its employees closer together, result in greater efficiency all along the line and in benefit to all concerned.

In many ways it is difficult for the officials of the company to know just how far these hopes are being realized. An employee closely in touch with the workings of his department can tell better than anyone else whether the standard of efficiency has been and is being raised, and he should be much interested in this question. From one point of view he is the same as a stockholder in the company, and a decrease in its earnings for any reason means a decrease in his earnings. The profit-sharing plan will be continued for another year, and it is hoped that the results will warrant its continuance indefinitely.

PRIZES FOR SUGGESTIONS.

The company, of course, wants to operate its plant as efficiently as possible, and desires to secure efficiency in all lines of work. In handling material, in transportation, in methods of manufacture, in clerical work, in every line of its operations the company wants to secure the best results, and this can only be done by using the best methods. The company wants to make products of the highest quality. The company wants to safeguard its plants and prevent unnecessary accidents. All these things the company desires to do, and it would like the employees to help it do them. To this end employees are asked to give the company the benefit of their ideas. It has been decided to give $50 each month for the best suggestions received from employees, the money to be divided as follows:

First prize	$25.00
Second prize	15.00
Third prize	10.00

Department heads and their assistants will not be eligible to receive prizes.

Suggestions must be made in writing.

The suggestions received will be examined by a committee each month, and the awards made as promptly as possible.

Unusual Casts of Low Phosphorus Iron

The following analyses represent the casts of Chateaugay low phosphorus pig iron made at the Standish furnace of the Northern Iron Company at Standish, N. Y., August 2 to August 5, 1911. The low and uniform sulphur and phosphorus percentages are particularly noteworthy:

Cast.	Tons.	Silicon.	Sulphur.	Phos.
194	34	1.15	.028	.023
195	26	1.10	.019	.023
196	30	1.32	.017	.022
197	36	1.70	.019	.022
198	33	1.75	.018	.020
199	27	1.50	.017	.020
200	32	1.40	.016	.019
201	30	2.15	.015	.020
202	32	1.60	.016	.020
203	33	1.25	.021	.020
204	22	1.30	.017	.018
205	33	1.10	.017	.022
206	34	1.45	.014	.021
207	33	1.10	.016	.022
208	32	1.00	.019	.022
209	30	1.25	.017	.024
210	31	1.53	.016	.020
211	28	1.50	.017	.021
212	32	1.35	.016	.021
213	34	1.35	.017	.019

Alternating-current motors for elevator service were recently discussed in an article in the *Electric Journal* by A. G. Popcke. He explains that it has been found that squirrel-cage motors in sizes up to 15 or 20 hp. are satisfactory for elevator service. A speed of 720 r.p.m. is also mentioned as most desirable, and that, therefore, 8-pole 60-cycle motors of the squirrel-cage type are mostly used for this kind of service. The controller is a reversing drum type switch which connects the motor directly across the line. It is located near the motor and is operated by means of a rope or lever in the elevator car. This type of motor is rarely used when the elevator speed exceeds 150 ft. per minute, since the power will usually exceed 20 hp. at the higher speeds.

Generating Oxygen and Hydrogen Electrolytically

Electrolytic generation of oxygen and hydrogen has been known abroad for some time, but was not done in this country until the International Oxygen Company, 68 Nassau street, New York City, acquired the American rights for the gas-producing appliances of two prominent French companies. The two gases are being used more and more extensively for oxy-acetylene welding and cutting of metals as well as the oxy-hydric process. It is essential that the gases used in either of these processes be free from impurities of all kinds if the best results are to be secured. The electrolytic process of generation, it is emphasized, results in the securing of gases which are free from chlorine or nitrogen, impurities which very materially reduce the efficiency of the oxygen and the hydrogen. At the present time the International Oxygen Company is producing oxygen and hydrogen for commercial use and is also building generators of the type illustrated herewith for use in plants where it is desired to produce the gases and have the process under the direct control of the user. Fig. 1 is a view of the generator employed, while Fig. 2 is a sectional view giving some of the constructional details.

It is claimed for these plants that they are simple and reliable in operation, require no expert attention and have a very low maintenance cost. The cost of the oxygen which is produced by the electrolysis of water is very low and is practically the same as that of the current used. The generator is very simple in construction and consists of an iron tank, A, Fig. 2, which is utilized as the negative pole and contains the perforated tank D which is the positive pole. This tank is suspended from the cover B and is separated from the outer tank by an asbestos sack, E, which divides the generator into two compartments. When the current is sent through the generator the water decomposes into its two constituents, oxygen and hydrogen, the former being given off on the wall of the inner tank and the other on the inner wall of the outer tank. The gases are thus produced in separate compartments and are absolutely pure, while an additional check against possible mixing is afforded by the asbestos sack which, when impregnated with the solution of caustic soda that is added to render the water more easily decomposed, forms an effective barrier between the two gases. The oxygen and the hydrogen do not pass directly from the generator to the pipes leading to the reservoirs, but are first led through

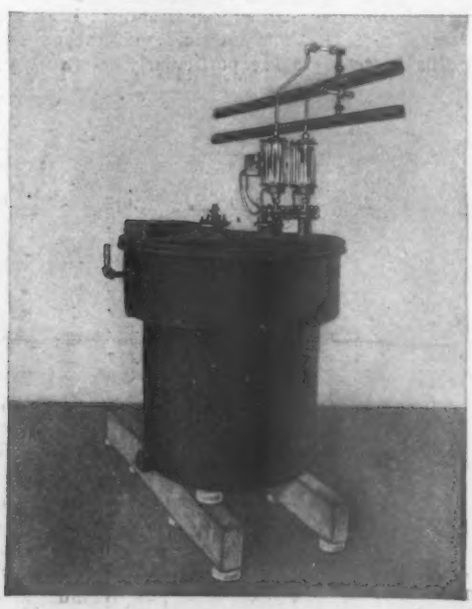


Fig. 1.—Exterior of a New Cell for Producing Oxygen and Hydrogen Electrolytically Made by the International Oxygen Company, New York City.

water placed in the glass lantern G on top of the generator. The rate at which the gases bubble through this water indicates the condition of the generator and serves as a check on its action. The hydraulic joint C between the cover and the tank is filled with oil and prevents the escape of either of the gases. As an additional precaution against short-circuiting the cover is kept separate from the tank by the use of wooden wedges and porcelain insulators H are placed underneath the cell to raise it from the floor.

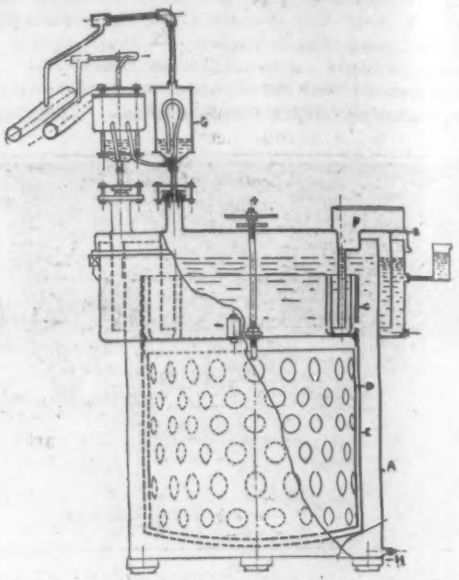


Fig. 2.—Sectional Elevation of the Generator.

The generator is filled with water, which can be supplied from any available source, the only precaution being that it must not be exceptionally acid or akaline. The use of either of these kinds of water will result in an excessive amount of impurities being thrown down to the bottom of the generator and clogging it. After the generator is filled with water through the hole F, about 80 lb. of sodium hydroxide is added to reduce the resistance of the water to the passage of the electric current. This hydroxide also forms a tension on the asbestos sack as previously mentioned and serves to keep the two gases from mingling. One gal. of water will produce 100 cu. ft. of oxygen, and as the output of the generator is only 65 cu. ft. per 24-hr. day but little attention is required beyond adding a small amount of water each morning. The amount of current required to produce this quantity of oxygen is 300 amperes at 2 volts. If it is desired to increase the amount of oxygen above this figure, additional cells can be connected in series to give the required amount. As 1 kw.-hr. will produce approximately 3 cu. ft. of oxygen and twice that quantity of hydrogen, the cost of making the gases in this way is approximately one-quarter that when they are produced in the ordinary way.

Fluorescent Test of Oil Contamination

The fluorescent test of oil adulteration discovered by Alexander E. Outerbridge, Jr., chemist and metallurgist of William Sellers & Co., Philadelphia, described by him in a paper read before the American Society for Testing Materials, is proving of practical value beyond the expectations of the discoverer, as the late experiences of Mr. Outerbridge attest. An extended reprint of the paper was given in *The Iron Age* of July 13. An importer of linseed oil from Europe, not doubting his oil was pure, tested a sample under the ultra-violet light and found a decided bloom. He took samples from 50 barrels and every one contained mineral oil. He said that a test of the ordinary sort would have cost about $500, and would not have been as convincing as were the fluorescent tests. An investigation showed that the oil was probably shipped in old petroleum barrels and that there was no intention of adding mineral oil. Mr. Outerbridge had suggested this very contingency for the reason that the different samples showed varying quantities of contamination, which likely would not have been the case were the contamination purposely made.

The Penn Iron & Coal Company, Canal Dover, Ohio, is relining its blast furnace and expects to have it ready for blast in September.

Specifications for Spelter

Proposed Standard of the American Society for Testing Materials

Standard specifications for spelter were drawn up for the American Society for Testing Materials, by its Committee B-2 on non-ferrous metals and alloys, Prof. William Campbell, of Columbia University, chairman, and submitted to the annual meeting of the society, which voted to refer them to a letter ballot of the society. They are as follows:

1. Under these specifications virgin spelter, that is, spelter made from ore or similar raw material by a process of reduction and distillation and not produced from reworked metal, is considered in four grades, as follows: A, High Grade; B, Intermediate; C, Brass Special; D, Prime Western.

2. A brand shall be cast in each slab by which the maker and grade can be identified.

3. The maker shall use care to have carload of as uniform quality as possible.

Composition of Grades of Spelter

4. *A. High Grade.*—The spelter shall not contain over 0.07 per cent. lead, 0.03 per cent. iron, 0.05 per cent. cadmium. It shall be free from aluminum. The sum of the lead, iron and cadmium shall not exceed 0.5 per cent.

B. Intermediate.—The spelter shall not contain over 0.20 per cent. lead, 0.03 per cent. iron, 0.50 per cent. cadmium. It shall be free from aluminum. The sum of the lead, iron and cadmium shall not exceed 0.5 per cent.

C. Brass Special.—The spelter shall not contain over 0.75 per cent. lead, 0.04 per cent. iron, 0.75 per cent. cadmium. It shall be free from aluminum. The sum of the lead, iron and cadmium shall not exceed 1.20 per cent.

D. Prime Western.—The spelter shall not contain over 1.50 per cent. lead, 0.08 per cent. iron.

5. The slabs shall be reasonably free from surface corrosion or adhering foreign matter.

Sampling for Chemical Analysis

6. Not less than ten slabs shall be taken as a sample from each car; for smaller lots, in the same proportion to the total number, but in no case less than three slabs. In case of dispute half of the sample is to be taken by the maker and half by the purchaser; and the whole shall be mixed.

The slabs selected as samples are to be sawed completely across and the sawdust used as a sample. In case no saw is available for this purpose, the slabs should be drilled completely through and the drillings cut up into short lengths. The saw or drill used must be thoroughly cleaned. No lubricant shall be used in either sawing or drilling, and the sawdust or drilling must be carefully treated with a magnet to remove any particles of iron derived from the tools.

7. *Lead.*—For the determination of lead in High Grade not less than 25 g., in Intermediate not less than 15, in Brass Special not less than 10, and in Prime Western not less than 5 g., shall be taken; that is, the sample used for analysis should not contain less than 0.01 g. lead.

Iron.—The sample for iron should contain not less than 25 g. for the three higher grades and not less than 10 g. for Prime Western. The entire sample must be dissolved, the iron precipitated as ferric-hydroxide, then re-dissolved, reduced, and the iron determined by titration.

Cadmium.—Dissolve 25 g. in 330 cc. of a solution of one part of hydrochloric acid (specific gravity 1.2) and five parts of water. Let it stand over-night; filter and wash; reject filtrate and dissolve the residue, which should be about 5 per cent. of the zinc, in nitric acid. Add 10 cc. of sulphuric acid; evaporate to fumes; dilute and filter out and wash the lead sulphate. Dilute the solution to 500 cc.; add 5 g. of ammonium chloride; pass a slow stream of hydrogen sulphide for one hour and let stand for about five hours; filter, wash with hot water; dissolve in 10 cc. of sulphuric acid and 50 cc. of water; filter and wash. Dilute to 400 cc.; precipitate with hydrogen sulphide as before. Weigh as cadmium sulphide or dissolve in hydrochloric acid and titrate with potassium ferrocyanide.

Claims

8. Claims to be considered shall be in writing within thirty days of receipt of material at customer's mill and the results of customer's test shall be given. The shipper shall be given one week from date of receipt of such claim to investigate his records and then shall either agree to satisfy the claim or send a representative to the mill.

(*a*) *Analysis by Car Lots.*—No claims shall be considered unless the minimum samples as specified for the grade in question can be shown to such representative.

(*b*) *Physical Defects of Individual Pieces.*—No claims shall be considered unless the spelter in question, unused, can be shown to such representative.

9. Where the spelter satisfies the chemical and physical requirements of these specifications, it shall not be condemned for defects of alloys in which it is used or for defects in the coating of galvanized products.

10. The maker's representative shall inspect all pieces where physical defects are claimed. If agreement is not reached the question of fact shall be submitted to a mutually agreeable umpire, whose decision shall be final.

On a question of metal contents an adequate sample shall be drawn by the representatives of both parties; the sample shall be prepared from the slabs so selected as described under "Sampling." The sample shall be mixed and separated into three parts, each of which shall be placed in a sealed package, one for each party and one for the umpire if necessary. Each party shall make an analysis and if the results do not establish or dismiss the claim to the satisfaction of both parties, the third sample shall be submitted to a mutually agreeable umpire, who shall determine the question of quality and whose determination shall be final.

11. The expenses of the maker's representative and of the umpire shall be paid by the loser or divided in proportion to concession made in case of compromise.

In case of rejection being established, damages shall be limited to the payment of freight both ways by the maker for substitution of an equivalent weight of spelter meeting these specifications.

The Brown Instrument Company's Expansion

The Brown Instrument Company, whose office and laboratory have been located at 311 Walnut street, Philadelphia, since 1860, is moving to larger quarters because of the great increase in its business, which has more than quadrupled during the past five years. The business was originally established by Edward Brown, who was the first manufacturer of pyrometers in the United States, and bore his name until recently, when an incorporated company was formed, of which Richard P. Brown is president. As electrical instruments play an important part in the construction of pyrometers, Mr. Brown has desired to superintend the manufacture of millivoltmeters for use in the company's pyrometers, so as to best design the instruments for pyrometric use. With this end in view, he has become president of the Keystone Electrical Instrument Company, Philadelphia, which, for a number of years, has manufactured voltmeters and ammeters. The shops and laboratory of the Brown Instrument Company are being combined with those of the Keystone Electrical Instrument Company at Ninth street and Montgomery avenue, Philadelphia.

By this arrangement the Brown Instrument Company and the Keystone Electrical Instrument Company will manufacture pyrometers, thermometers, speed indicators, draft gauges, recording gauges, voltmeters and ammeters, being now in a position to manufacture or repair practically any type of instrument. Slight changes in the Keystone millivoltmeters have been made at Mr. Brown's suggestion. In addition to the works and office at Ninth street and Montgomery avenue, Philadelphia, an office will also be maintained for the present at 311 Walnut street, and the branch offices of the Brown Instrument Company at Pittsburgh and Chicago will also be continued.

An apparatus for threading nuts has been made the subject of a patent granted July 25, No. 999,090, awarded to Albert H. Bray and assigned to the Detroit Screw Works, Detroit, Mich. It forms part of a nut tapping machine.

S. DIESCHER & SONS.
Mechanical and Civil Engineers,
PITTSBURGH, PA.

The Thompson Automatic Cut-Out Hanger

As a safety device in mills and factories and a means of reducing the cost of operation the Thompson Hanger Works, 337 Superior avenue, N. W., Cleveland, Ohio, has brought out an automatic cut-out hanger for arc lamps. This hanger is designed for either direct or alternating current circuits and to enable a great deal of wire to be eliminated. Access to the lamp is rendered easy, without using cranes or ladders. The lamp is automatically cut out of the circuit when it is lowered, while raising it automatically re-establishes the circuit.

Two views of the hanger are given, Fig. 1 showing the lamp raised and in use, while Fig. 2 illustrates the lamp being lowered. Among the advantages claimed for this hanger are a saving in time in caring for lamps, the elimination of the danger that accompanies lamp trimming from a crane and the doing away of the long swaying lengths of conductor wire, which are not only unsightly and expensive, but are dangerous to life and property.

The construction of the hanger is simple and substantial, and the device is positive in operation. There are but two members, an upper and a lower one, both parts being connected by brass latches. A sheave wheel in cast-iron housings is mounted in each part, and the latches are fastened to the outside of the housings and insulated therefrom. These latches form the physical and electrical connection between the two parts of the hanger, and a short, quick jerk on the rope separates them, and the lower one travels down with the lamp. The line wires are connected to binding posts in the upper section and the lamp is connected by short leads to the binding posts in the lower part. By employing two pulleys the weight of the lamp on the lifting cord is reduced one-half and the suspension is not subjected to any strain except when the lamp is disconnected, as shown in Fig. 2.

With this hanger the lamp may be placed in any desired location, and can be readily reached by lowering it to the ground or the floor. The hanger is fitted with a top bail, so that it can be attached conveniently to a pipe bracket, cable, truss, ceiling or other support. If it is more convenient the hanger may be placed in the peak of the roof or at some other point which is considerably higher than the desired position of the lamp, the hight of the latter being adjusted by extending a rope or wire to the lower section of the hanger and the lamp. A universal joint connection between the hanger and the lamp enables the latter to swing in any direction, while a guard prevents rocking in the latches. All the parts of the hanger are insulated, and the hanger itself is protected by a weather-proof cover. Although designed primarily for indoor use, this hanger can also be used for street lighting service.

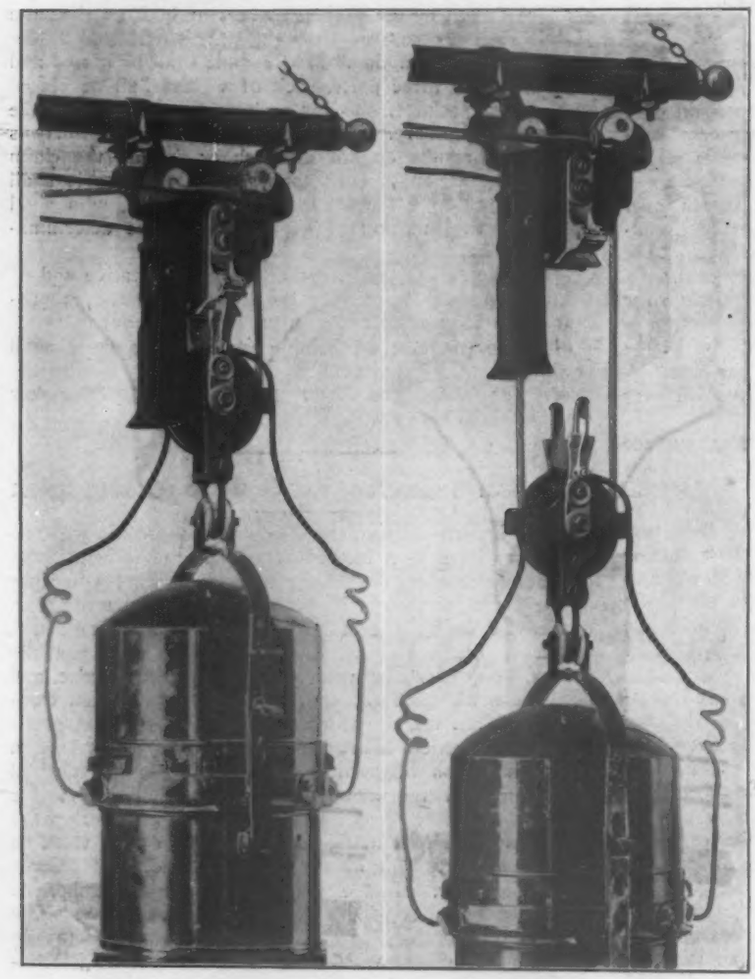


Fig. 1.—The Lamp in Use. Fig. 2.—The Lamp Being Lowered.

Two Views of an Arc Lamp Equipped with the New Automatic Cut-Out Hanger Made by the Thompson Hanger Works, Cleveland, Ohio.

Another Plan for Stock-Owning by Employees

The Union Switch & Signal Company, Pittsburgh, has in operation a plan by which its employees can become stockholders. Early in the year the company increased its capital stock to give the stockholders an opportunity to make additional subscriptions. After they had subscribed there were some 2000 shares unused. These were set aside for the employees, to be purchased on easy terms. The plan was worked out and the employees, more than 1800 in number, are taking advantage of the offer. The stock is selling at $75 a share.

An employee can purchase a share of stock by paying $1.50 monthly. This would amount to $18 the first year. He would pay the same amount the second year, but a dividend amounting to $6 would be added. A dividend during the third year would bring his payments up to $24, which would leave but five months of the fourth year upon which payments would have to be made. The employee then has the privilege of taking out a participation certificate or a regular stock certificate. The employees are divided into three classes: In Class A are employees whose annual compensation does not exceed $1,000, and five shares is the maximum number for which they can subscribe. In Class B are employees whose annual compensation is $3,000 or less. The maximum purchase is 13 shares. Class C is for employees whose annual compensation exceeds $3,000. The maximum placed on them is 20 shares.

If a subscriber cancels his subscription he is to be refunded all he has paid in, with 5 per cent. interest. If an employee dies or becomes permanently disabled payment will be made to his estate or to him as the case may be.

A coal high in sulphur from its own mines is used by the Lackawanna Steel Company for its 45,000 hp. of boilers. The coal is of high calorific value, but in other respects is a poor steam coal and gives an ash that fuses into a dense hard clinker. It was found impossible to use this coal on overfeed stokers and only with difficulty could it be used by hand-firing, and when so used required so much steam that the combined boiler and furnace efficiency was less than 50 per cent. A trial Taylor stoker gave a combined boiler efficiency of 75 per cent. at 135 per cent. of boiler rating, according to Walter B. Snow, Boston, and in a four-hour test developed 198 per cent. of boiler rating.

Frank Toomey, Inc., has purchased the equipment of the Bonneville Cement Company, Siegfried, Pa., and is offering it for sale either in whole or in part. The plant consists of five steel buildings, a number of frame structures, 33 acres of real estate, of which only about 10 per cent. has been developed. The plant is located on the Central Railroad of New Jersey and has a capacity of 400,000 barrels of cement per year.

The Machinery Markets

While the machinery inquiries are more plentiful in some selling centers and business is improving, the trade in the East is noticeably dull. Current orders in New York and Philadelphia are small and there is sharp competition in both cities for such business as is in sight. The situation is somewhat better in New England, where the automobile trade is buying and the general demand is picking up. Inquiries for machine tools are increasing in Cincinnati, although there are signs of impending labor troubles in the West. The Cleveland market is dull and has no distinctive features. There is a fair improvement in small orders for machine tools in St. Louis and the call for metal-working equipment is on the increase on the Pacific Coast. Wood-working machinery is in good demand in the latter market. Business is satisfactory in the South, where refrigerating equipment is selling well. The market for irrigating machinery and equipment for making cotton seed oil products is decidedly good in Texas.

New York

NEW YORK, August 16, 1911.

There is very little demand for machinery in the New York market and dealers are not encouraged over the outlook. It is apparent that August will not be a very big month. The railroads are slow about placing orders for equipment about which they have inquired and the call from general manufacturers is small.

Export inquiries and sales continue to help the market materially and some good business has been placed by Japanese engineering houses which have been buying machine tools for railroad interests. Exporters, who buy for the European market, have been contributing a steady volume of business to the machine tool trade of late and considerable wood-working machinery is being sold for delivery abroad. The Canadian railroads and the Canadian car manufacturers continue to make good purchases in this market.

A noticeable feature locally is the absence of new manufacturing enterprises; a number of projects which were expected to result in business by this time have been held up.

Smith & Kaufman, manufacturers of silk ribbons, with New York offices at 569 Broadway, will build a new two-story brick factory at Leonia, N. J. This will include a manufacturing building, 105 x 161 ft., and a power house, 40 x 80 ft. The power equipment has not been decided upon as yet.

The Fagan Iron Works, Fourteenth street, Jersey City, N. J., has acquired a tract of land adjoining its present works and is planning the construction of an office building, warehouse and other structures. The plans for the buildings have not as yet been completed.

The Globe Malleable Iron & Steel Company, Syracuse, N. Y., is installing some additional hammers, both steam and board drop presses, a high-duty plane, lathe and universal miller and some additional die room equipment.

The Fatoute Iron & Steel Company, 65 Lawrence street, Newark, N. J., has acquired a large tract of land at Frelinghuysen avenue, that city, for the erection of the new plant.

The British Vacuum Ice Machine Company, at 124-7 Minories, London, England, is inquiring in this market for manufacturers who can take over the American rights for making a small type of the hand ice-making machines.

The Torrington Building Company, Torrington, Conn., has been awarded the contract for the erection of an addition to the plant of the Simplex Automobile Company at New Brunswick, N. J. The structure will be 66 x 319 ft. and two stories.

The Delaphena Company, Poughkeepsie, N. Y., is having plans prepared for a manufacturing plant which it will erect in that city on a site having an extensive frontage on the Hudson River.

A two-story factory, 68 x 148 ft., for the manufacture of safes and automobiles supplies, is to be erected at Yonkers, N. Y., by A. R. Mosler & Company, New York City.

The Plastergen Wall Board Company has been incorporated at North Tonawanda, N. Y., with a capital stock of $25,000. The company will commence operations on September 1 in the buildings formerly occupied by the Martinizing Process Company which are now being equipped for the purpose. The officers of the company are Carl G. Whattier, president; John C. Baines, vice-president; Arthur H. Showalter, secretary, and Henry J. Boeckel, treasurer, all of Buffalo, N. Y.

The Buffalo Steam Pump Company has purchased the large factory building of the Ideal Sectional Building Company adjoining its plant at Oliver street and the Erie Railroad, North Tonawanda, N. Y., and will remodel and equip it for use in connection with its present plant.

The Rand Company, North Tonawanda, N. Y., has taken over the business of the Time Saver Company, Boston, and will remove the plant of the latter company to North Tonawanda early next month. An additional story is being built on the factory building of the Rand Company to provide space for the new business.

The Star Electric Company, Binghamton, N. Y., has let the contract for the erection of a factory building 60 x 100 ft., two stories.

The Mitchell & Church Company, Binghamton, N. Y., will build a factory, 45 x 126 ft., four stories, of brick and terra cotta on Water street that city.

The Delaware & Hudson Railroad Company will install a coaling plant and ash pit at Binghamton in connection with the new roundhouse it is building at the east end of the Binghamton yards. Geo. Burgess is chief engineer, Albany, N. Y.

A pump mill, 60 x 100 ft. and one story, is to be built at Norwood, N. Y., by Martin Bros., from plans prepared by the Stebbins Engineering Company, Watertown, N. Y.

The Elmira Water, Light & Railroad Company has let the contract for a two-story addition, 36 x 52 ft., which it will make to its power house on Madison avenue.

The Corning Glass Works, Corning, N. Y., has let the contract to Gahren, Dodge & Maltby, New York City, for the erection of a one-story addition, 92 x 280 ft., to be made to its blowing room and an addition to its storehouse, 60 x 184 ft. one story, at the plant of the company on the New York Central Railroad.

The water-works system, Mexico, N. Y., for which plans are being prepared by W. G. Stone & Co., engineers, Utica, N. Y., will include a pumping station, 30 x 32 ft. one story, a sheet-steel standpipe 22 ft. in diameter by 80 ft. in hight, a considerable number of gate valves and hydrants and nine miles of cast-iron pipe from 12 to 4 in. in size.

The Crown Metal Furniture Company, Jamestown, N. Y., is having plans prepared for a new factory which it will build on a 4½-acre site recently purchased with a frontage of 300 ft. on the Erie Railroad at East Jamestown. The main building will be about 400 ft. long.

New England

BOSTON, MASS., August 15, 1911.

Indications multiply that business is improving and that the change will become more sharply accentuated with the coming of cold weather. The machinery houses are doing more business than they had expected for this season of the year. The dealers have booked a good many orders in the past fortnight, though few of them are large. The automobile trade is buying more freely than had been anticipated, chiefly the special machinery which will increase quality and, more particularly, will decrease cost. The prospect is that this demand will be a constant one, perhaps increasing. Poor crops in New England will probably restrict local buying of agricultural equipment.

The amount of new building construction is evidenced by the demand for galvanized sheets which is considerably larger than in 1910. The black sheet market is fairly active. Some cutting of quoted prices is reported as confidential transactions to secure immediate specifications. Copper and the pig metals generally are in fairly active demand in this territory.

The promise of a boom in the cotton industry is becoming brighter each day. At the present time the manufacturers are producing as slowly as possible, in the face of present high prices and the harvesting of

THE MACHINERY MARKETS

the great crop which should bring the market down to normal conditions. But even now production is fairly good, as compared with the last year, because of immediate requirements of customers, whose stocks are sadly depleted. With the return to lower prices the whole country will have to be stocked up which will mean full capacity production with the mills and a strong demand for textile machinery and other mill equipment.

The large machinery requirements of the Boston & Maine system have been still further augmented by the destruction of the repair shops and round house of the Maine Central Railroad at Calais, Me., with a loss of $110,000. The shops were equipped quite recently with modern machine tools, which will doubtless be replaced in the near future, for the conditions which lead to their purchase still exist.

The Bicknell-Thomas Company has been organized at Greenfield, Mass., to manufacture Wahlstrom's patent friction clutch for machine tools up to 10 hp., and a line of tapping attachments and other screw cutting accessories which will be sold to the Wells Bros. Company of Greenfield. F. O. Wells is the president of the new company; F. A. Bicknell superintendent and W. C. D. Thomas, secretary and treasurer. The company states that it has taken the factory recently occupied by the E. F. Reece Company at Greenfield.

The Archer Company, New Haven, Conn., has been organized to manufacture specialties. The company is now negotiating for the purchase of a factory. The incorporators are: Frank R. Graves, Roscoe E. Peterson and Samuel B. Pettengill.

In connection with the election of W. H. Whiteside to the general managership of the Stevens-Duryea Company, Chicopee Falls, Mass., the report has gone abroad that the step is in connection with a consolidation of interests. The company makes the statement that such is not the case. Mr. Whiteside was, until recently, general manager of the Allis-Chalmers Company, a fact which probably gave rise to the report. He succeeds Irving H. Page, who wishes to be relieved of the active management of the business, that he may devote his time to the J. Stevens Arms & Tool Company.

The business of the R. L. Morgan Company, Worcester, Mass., builder of motor trucks, has been reorganized and placed upon a substantial financial basis, under the name of the Morgan Motor Truck Company. Of an authorized capital stock of $1,100,000, preferred stock to the amount of $144,800, a special preferred to the amount of $75,000, and common to the amount of $500,000, has been issued. The indebtedness of the old corporation has been taken care of. Harry Unwin, New York, is the president, Evan F. Jones, treasurer. The directors are: Mr. Unwin, Mr. Jones, who is the general manager of the Morgan Spring Company; Jerome R. George of the Morgan Construction Company, John E. Bradley, head of the Bradley Car Works, all of Worcester, and Lancaster P. Clark, manager of the machinery division of the Blake & Johnson Company, Waterbury, Conn. Charles H. Derby is the clerk of the corporation. Ralph L. Morgan, founder of the business, has been engaged as consulting engineer. The company's truck has been successful, and the plan is to proceed in its manufacture and development, aggressively but conservatively.

Some interest is expressed in the incorporation of the R. H. Machinery Company, Hartford, Conn., with a Connecticut charter and a paid-in capital stock of $375,000. Richard H. Long, South Framingham, Mass., is the president and treasurer, and Alton Bennett, Springfield, Mass., the secretary. The company, which succeeds a Massachusetts corporation of the same name, will manufacture machinery, and will carry along the line of shoe machinery which Mr. Long has been developing for some years at his works at South Framingham.

It is understood that the Mead-Morrison Company, Cambridge, Mass., manufacturer of hoisting and other machinery, has deferred the establishment of new and much more spacious works. The plan had been to proceed with the enterprise in the immediate future; in fact the project would have been well under way by this time had it not been for a change in management resulting from death.

The Jaeger & Sword Mfg. Company, New London, Conn., has established a factory at 192 Main street, that city, for the manufacture of the Jaeger patent roll grip mandrel and other metal goods. It is a new Connecticut corporation, with capital stock of $35,000. The incorporators are Max Jaeger and William F. Sword, New London, and Edward J. Hayes, Pawtucket, R. I.

The Hart & Cooley Company, New Britain, Conn., manufacturer of steel registers and lockers, will erect a storage building 50 x 75 ft., two stories.

The Diamond Machine Company, Providence, R. I., announces to its customers that its shops will be closed for the annual vacation from August 26 to September 5, during which time correspondence will be handled as usual and shipments made from stock.

The Regal Silver Mfg. Company, Bradley and William streets, New Haven, Conn., will be in the market for drop hammers. The company has just been organized with a Connecticut charter and capital stock of $25,000. M. L. Baker is the president and secretary; William Cun, vice-president, and G. F. Hemming, the third director. The product will be table cutlery and plated ware.

The Shoe Hardware Company, Waterbury, Conn., will erect an addition 86 x 96 ft., five stories, of brick mill construction.

B. F. Perkins & Sons, Inc., Holyoke, Mass., will build a brick addition 100 x 200 ft., two stories.

The Blakeslee Drop Forging Company, Southington, Conn., has increased its capital stock from $50,000 to $150,000.

The Eastern Maine Railroad has been incorporated under an act of the last Maine legislature, with a capital stock of $500,000, with the privilege of increasing to $2,000,000, to build and operate a line from Brewer to Houlton, Me., crossing the Maine Central railroad at Bancroft. The directors are: William H. Taylor, New York; George W. Maxfield, Flavius O. Beal, Bangor, Me.; Harlan P. Sargent, South Brewer, Me.; Alfred G. Chambers, Haynesville, Me.; president, George W. Maxfield; treasurer, Flavius O. Beal; clerk, Herbert M. Heath, Augusta, Me.

The Maine Central Railroad has acquired the Sandy River and Rangley Lakes Railroad.

Additions to general manufacturing plants of New England include the following: J. B. Martin & Co., Taftville, Conn., addition 50 x 60 ft., two stories; Killingly Mfg. Company, Killingly, Conn., a new corporation to enlarge Williamsville mill to 60,000 spindles; Hamilton Mfg. Company, Lowell, Mass., new mill, 135 x 268 ft., four stories; Brunswick Knitting Mill, Brunswick, Me., to rebuild plant destroyed by fire.

Philadelphia

PHILADELPHIA, PA., August 16, 1911.

Local merchants report business as just about holding even. Current orders continue small and sharp competition is to be noted for such business as comes out. Inquiries generally are confined to single tools and occasional small lots. Buying is light and orders received come from widely scattered districts. While a great volume of business is not expected during August, the trade expresses very hopeful views for a more aggressive movement in the fall. The increased demand for rolling stock coming from the railroads is considered encouraging, although as far as being actual buyers of any tools in quantity the railroads in this district are still a negative factor. A fair amount of buying continues to be reported in special equipment and the smaller builders of machinery of that class are comparatively busy. Makers of the heavier class of equipment report a fair amount of new business in hand, as well as in prospect. The situation in the second-hand machinery market is without feature, the demand being dull and irregular. A moderate inquiry for power equipment is to be noted, small installations are coming out from time to time but as a rule close rather slowly. Inquiries for equipment of the heavier and high power type is light. The foundry trade is reported a trifle more active but the demand is still irregular, both for steel and iron castings, and slight spurts in business have, as a rule, been followed by duller periods.

The Baltimore & Ohio Railroad has an inquiry out for a medium size centering machine for Baltimore delivery.

The H. E. Grau Company is preparing to erect a $10,000 power house for the Presbyterian Orphanage, Fifty-ninth street and Chester avenue. The necessary permits for the work have been granted by the Bureau of Building Inspection.

In connection with various improvements recently authorized by the Baltimore & Ohio Railroad Company, permits have been taken out for the erection of

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water tanks and alterations to its pumphouse at Snyder and Meadow avenues; also for erection of water tank supports along the Delaware River near Synder avenue.

Contractors have been estimating on a one-story boiler, engine and pump house, 107 x 140 ft., designed by Frank C. Roberts & Co., for the Ebensburg Coal Company, Colver, Pa.

The receivers of the Screw Cutting Company of America have, we are informed, been dismissed and the obligations of the company met. The building of the company at Seventeenth street and Sedgely avenue will be disposed of. Engineers are designing new machines for continuous, accurate work at a commercial speed, after which it is proposed to reorganize the company.

The A. P. Witteman Company is about completing extensive improvements to its plant at Chester, Pa. A new power house is being built and a 200-kw direct-connected generator has been put in position. Foundations are also being laid for a 1,200-ton forging press. Several heavy machine tools have also been recently installed. This company reports business as being very good and the additions to both plant and equipment now being made will materially increase its facilities for heavy forging work.

The Department of Public Health and Charities, Joseph S. Neff, N. D., director, will receive bids until August 21 for the construction and equipment of a laundry building at Thirty-fourth and Pine streets, recently destroyed by fire. Plans, specification, etc., may be obtained from Philip H. Johnson, architect, 1824 Land Title Building, this city.

The Tindel-Morris Company, Eddystone, Pa., notes a somewhat better demand for its special line of tools. In its forging department a decided improvement in business is reported. This company has recently shipped one of its 17-in crank shaft lathes for export to Germany; one of the same size has also been furnished the York Mfg. Company, York, Pa., and an order is in hand for a 24-in. machine for a Western concern.

Sauer & Hahn, architects and engineers, are engaged on plans for a group of buildings to be erected in Camden, N. J., for the American Artificial Silk Mfg. Company. The preliminary plans have been completed and the plant will consist of a main building of reinforced concrete, with brick and terra cotta exterior 72 x 180 ft. and four stories. On either side of the main building will be one-story buildings, 26 x 151 ft. The manufacturing department, consisting of a one-story building 180 x 324 ft., is also included. Sawtooth skylights will be placed on the one-story buildings. The exterior walls of the various buildings will have a minimum pier construction and maximum glass area. The power plant will be housed in a building measuring 50 x 120 ft.

Chicago

CHICAGO, ILL., August 15, 1911.

A better tone is reported as prevailing in the machinery trade during the past week, although floor sales were not especially active. Inquiry for new tools has improved, but the demand for second-hand equipment has been so slow as to cause an accumulation of used tools in the hands of some of the dealers. The Chicago & Northwestern Railway has added another list of tools to its previously reported requirements, which will increase its purchases by about $8,000. The several boring mills, vertical lathes for which the International Harvester Company has asked prices, have not yet been placed. One sale of interest reported included a group of six milling machines.

Tenders are being asked until August 21 covering the furnishing and delivery of pump barrel castings for the Fourteenth Pumping Station, Chicago. Plans and specifications may be obtained at the office of the Director of Public Works.

The Russell Bronze Company, Chicago, with a capital stock of $20,000, has been incorporated by M. S. P. Thomas, W. S. Underwood and R. Swanston to manufacture ornamental bronze fixtures.

The Midland Electrical Mfg. Company, Chicago, has been organized to manufacture mechanical devices. The capital stock is $50,000 and incorporators are Andrew Engstrong, Arthur O. Carlson and Frederick Deiser.

The Joor Engineering Company, Chicago, contractor and manufacturer, has been incorporated with a capital stock of $60,000 by Samuel E. Joor, Frank Walsh and A. B. Gordon.

The Oakdale Iron Company, Chicago, has been incorporated with a capital stock of $25,000 to engage in the iron and steel business, the incorporators being Jacob Ringer, Ludwig Loewenstein and Milton N. Hirsch.

Canners Can Company, 4840 South Western avenue, Chicago, has been issued a factory building permit providing for a $200,000 structure.

H. M. Byllesby & Co., Chicago, engineers and managers of public utilities, confirm the reported purchase of the Sioux Falls Light & Power Company, of Sioux Falls, S. D. This company owns and operates a water-power generating plant on the Big Sioux River, reinforced by a modern steam auxiliary station, and serves the greater part of Sioux Falls with current for lighting, transportation and power. Formal possession will be taken in a few days with N. C. Draper, formerly of Zanesville, Ohio, as manager. Improvements and extensions will be made to the property.

The Co-Operative Stove Company, Bloomington, Ill., will conduct a general foundry business with an authorized capital stock of $50,000. The incorporators of the company are Jno. W. Hayes, A. C. Hamilton and E. N. Hamilton.

The Central Malleable Iron Company, Decatur, Ill., has changed its name and will operate in the future as the Decatur Foundry Company.

The Fairbury Electric Light Company, Fairbury, Ill., has just purchased a 300-hp boiler in connection with the enlargement of its plant and also contemplates the installation of additional power equipment.

Williams, White & Co., Moline, Ill., are about to let the contract for a new machine shop adjoining their present plant. The new building will be of steel construction, 52 x 142 ft.

The Marseilles Hydraulic Company, Quincy, Ill., Duncan McDougal, president, is about to let contracts for the construction of an electro-hydraulic plant capable of developing 8000 hp.

The city of Paxton, Ill., will construct and operate a $17,000 electric light plant, for which an issue of bonds has already been authorized.

The International Tank & Pump Company, Decatur, Ill., has been incorporated with a capital stock of $5,000 to manufacture and deal in pumps. The incorporators are W. C. Field, L. R. Taylor and W. R. Batchelder.

The Waukesha Motor Company, Waukesha, Wis., has increased its capital stock from $100,000 to $200,000, the purpose being to provide for an enlargement of its plant and the installation of considerable special machinery.

The National Boat & Engine Company, Shell Lake, Wis., is preparing plans for the erection of a new plant at that place.

The Edgar Veneer & Mfg. Company, organized with a capital stock of $15,000, Mr. C. C. Barrett, president, contemplates building a veneer factory at Edgar, Wis., a short distance from Wausau.

The Colby Motor Company, Mason City, Iowa, is planning the erection of an addition to its present plant to be 150 x 400 ft. long and two stories.

The Minnesota Box & Lumber Company, St. Paul, Minn., was recently destroyed by fire, causing a loss of $75,000.

The Lafayette Safe & Lock Company, Lafayette, Ind., is about to build an addition to its plant which it hopes to place in operation within six weeks.

The Dakota Welding & Mfg. Company, New Rockford, N. D., has been organized with a capital stock of $20,000. The incorporators are David F. Geiger, Jno. A. Geiger and O. W. Munsell, all of that city.

The Cascade Flouring Mill Company is arranging to double the capacity of its mill at Cascade, Mont., in which connection new machinery will be installed.

Cleveland

CLEVELAND, OHIO, August 15, 1911.

The local machinery market is dull. Dealers generally report a lighter demand for machine tools than during July. Last month some of the automobile manufacturers placed orders for round lots of machinery covering their requirements for making their 1912 output, but orders from this source are now scarce, being limited mostly to an occasional order for a very small lot of tools. Other business is scattering and confined largely to single tool orders. As August is usually a very dull month with the machinery trade the present inactivity is not unexpected. The outlook for the fall business is regarded as somewhat more favorable than

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early in the summer. Reports from manufacturers in metal working lines generally indicate that orders are more plentiful than they were earlier in the summer. The outlook in the automobile industry is considered very satisfactory. Some large orders for automobile parts have been placed recently and a number of manufacturers of automobile parts have all the work they can do for some time. Second-hand machinery is moving slowly. The demand for mill supplies is fair.

The installation of additional equipment made necessary by a steady growth of its business has resulted in the Park Drop Forge Company, Cleveland, reaching the limit of its present capitalization and the company has increased its capital stock from $140,000 to $250,000. In addition to installing some additional small drop hammers the company has recently put in two 1500-ton hydraulic hammers and an Ajax upsetting machine and its plant is now equipped for turning out all of the heavier work in automobile forgings. No room is left in the present plant for further expansions and the company now has under consideration the erection of an addition, which will probably be built during the coming fall. The company reports that it has recently taken some large orders and the amount now on hand necessitates running the plant overtime.

The Alliance Brass & Bronze Company, Alliance, Ohio, will shortly begin the erection of a new plant. The company has closed a deal with the Alliance Board of Trade for a 2¾-acre site adjoining the Cleveland & Pittsburgh Railroad tracks. One building, 100 x 40 ft., will be erected at once and an office building and pattern room will be erected later. The new plant will enable the company to largely increase its output. The officers are C. J. Rath, president; John Bracher, vice-president and treasurer, and C. W. Smith, secretary.

The Perfection Spring Company, 2415 Superior avenue, Cleveland, has acquired the plant of the Standard Brass Foundry Company, 6608 Central avenue, and will remodel and enlarge it. When the changes are completed the spring company will operate the new plant as well as its present one. In addition to its present line of automobile springs the company will shortly place on the market a new automobile motor. Twelve new furnaces and considerable spring manufacturing machinery will be installed. To provide for its extensions the Perfection Spring Company has increased its capital stock from $200,000 to $500,000.

The Standard Brass Foundry Company has opened temporary quarters on Columbus road and expects to build a new foundry for the manufacture of brass, bronze and aluminum castings as soon as a site is secured. This company has just increased its capital stock from $50,000 to $100,000 and will add additional names to its board of directors.

The Ferro Machine & Foundry Company, Cleveland, is enlarging its plant by the rebuilding of a large part of its present foundry, the new building being of fireproof construction. This will give the company about double its present foundry capacity. Some new equipment will be purchased, including conveyors and trolley systems.

The Board of Trade of Alliance, Ohio, has closed a contract with the Michigan Twist Drill Company, Detroit, Mich., to locate in that city. A new plant will be erected by the company just west of the plant of the Transue & Williams Company.

The Youngstown Sash Weight Company, which has commenced the erection of a new plant at Girard, Ohio, will make sash weights, flue rings, elevator weights, tampers, iron horse hitchers, brake shoes and other products. The new building will be 35 x 125 ft., one story high. An old foundry building adjoining will be overhauled and a new cupola installed. O. A. Potts, of Youngstown, is the manager.

The Mather Spring Company, recently incorporated in Toledo, Ohio, will erect a plant, 70 x 400 ft., for the manufacture of automobile springs.

The Republic Rubber Company, Youngstown, Ohio, will make further extensions to its plant, which with new buildings now under construction will practically double its capacity.

The Canton Grass Clipper Company, Canton, Ohio, has been incorporated with a capital stock of $20,000 by Otto Karcher and others.

An ice manufacturing plant will be built by the Bevin Company, Steubenville, Ohio.

The Rummell Machine Company, Cleveland, Ohio, maker of screw machine products, is building a new plant on West Seventy-seventh street, 32 x 120 ft., and one story. The company will shortly be in the market for several automatic screw machines and a few machine tools.

It is reported that the Buckeye Iron & Brass Works, Dayton, Ohio, will build a new five-story plant.

The Riverside Bridge Company, Martins Ferry, Ohio, will increase its capital stock to $300,000 for the purpose of adding to its equipment and increasing the capacity of its plant.

Henry Wagner, of Cincinnati, has placed a contract with Sol Mendelsson, Elyria, Ohio, for the erection of a garbage disposal plant in Elyria.

An increase in capital stock from $500,000 to $1,000,000 has been authorized by the stockholders of the Standard Welding Company, Cleveland. The company recently remodeled parts of its plant and has added several new buildings in the past year, the new capital covering these improvements as well as preparing for steady growth in the welding industry in this city, the demand for welded parts by automobile manufacturers having largely increased.

At the annual meeting of the Toledo Machine & Tool Company, Toledo, Ohio, August 25, the following officers were elected: E. P. Breckenridge, president; H. J. Hinde, vice-president and general manager; L. J. Hinde, secretary; Charles W. Greenig, treasurer, William W. Edwards and E. C. Edwards were made directors. It was decided at the meeting to have the plans prepared for an extension to the company's plant which will be made in the near future.

Cincinnati

CINCINNATI, OHIO, August 15, 1911.

There is a slightly better inquiry for medium sized lathes reported, but orders for all kinds of machine tools continue coming in very slowly. In spite of reported impending labor troubles in the West, mail reports and those from traveling salesmen, would indicate that the general trade is taking a more cheerful view as to the near future.

The recent stiffening of pig iron prices is said to have brought the foundries a little extra business, but as a rule they are operating to only about 50 per cent. of capacity.

Crop reports are eagerly watched by all manufacturers, and so far as the Central West is concerned, they are excellent.

The American Rolling Mill Company, Middletown, Ohio, rolled its first sheets in the new east-side works August 8. Only four of the eight mills were started, but the plant is expected to be in full operation early in the Fall.

The Triumph Electric & Ice Machine Company, Oakley, Cincinnati, has recently closed contract for the construction of a 30-ton ice plant at St. Petersburg, Fla., for the N. C. Williams Company, of that city.

The Toledo Railway & Light Company, Toledo, Ohio, has let contract to A. Bentley & Sons, of that city, for the construction of a large boiler house addition to its repair shops on Detroit avenue.

The Brewers Bottle Case Association, having a large band saw mill at Hays, Ky., and a factory at Sandusky, Ohio, has acquired a site in Cincinnati, and will soon move its Sandusky plant here. The company manufactures a patent beer bottle case, and will employ about 50 men at the outset. S. E. Patton is president of the association and Charles W. Smith, secretary and treasurer.

The Cincinnati Commercial Association expects to be able to announce soon the location of a large automobile factory here, and it is understood that tentative plans have already been agreed on as to manufacturing quarters.

The Cincinnati Fire Extinguisher Company has been incorporated with $50,000 capital stock, and has leased a building at 2070 Reading road, Cincinnati, that will be used for manufacturing automatic sprinkling equipment. Harley Duley, now connected with the Cincinnati Fire Prevention Bureau, is said to be one of the principal incorporators.

The J. H. Day Company, Cincinnati, manufacturer of bakers', paint, laboratory and other special machinery, is having plans prepared for an addition to its plant on Harrison avenue.

The Riley Shoe Company, Columbus, Ohio, will build an addition to its shoe factory. F. L. Packard, Columbus, drew up the plans.

It is quite probable that the city of Newport, Ky., will soon advertise for bids on new boilers to replace those now installed in the City Waterworks plant.

The Crescent Tool Company, Cincinnati, has been

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incorporated with $10,000 capital stock to take over the business of the Crescent Machine & Tool Company, 115 West Second street, manufacturer of metal specialties, including a new patented car mover. No additions to the present plant are contemplated.

Kirk & Blum, Cincinnati, sheet metal workers, are moving into their new factory in the western part of the city. This move more than doubles their manufacturing capacity.

There is an unconfirmed report that the Columbus Buggy Company, Columbus, Ohio, will soon make some large additions to its plant.

Detroit

DETROIT, MICH., August 15, 1911.

Conditions in the machinery market locally are highly encouraging. While large individual orders for machinery are few, the many small orders indicate a healthy condition in nearly all manufacturing lines. A member of one of the largest machinery and mill supply houses in this city, whose experience would reflect general conditions, states that his firm has experienced a marked increase in orders booked during the last 40 days, and particularly in the last two weeks. He states further that prospective business is larger than at any time in the firm's history, but that the individual amounts are characteristically small and well scattered.

The automobile industry continues to hold the spotlight, especially in Detroit. There seems to be no limit to its possibilities. Reports of extension and increases of capacity are on every hand, making a fertile field for sellers of high grade machinery. The market for high price cars of standard make is remarkably strong.

There is little change in building conditions. Considerable activity is more or less evident, but owners seem reluctant to award contracts on many buildings that are already figured. No doubt fall will see many of these contracts placed and the buildings pushed to a rapid completion. No new plans of special mention are noted.

The Abbott Motor Company has opened a factory branch at 260 Jefferson avenue, in the new Dodge Building, under the management of E. C. Thompson, of the sales organization. A complete service department and garage will be inaugurated in the branch for use of Abbott-Detroit cars.

The State Railroad Commission has authorized the organization of the Consolidated Light & Power Company, Detroit, with a capital stock of $100,000. The stockholders are J. L. Hudson, F. R. Poss and C. A. Abbott, of this city.

The Lavinge Mfg. Company has increased its capital stock from $50,000 to $100,000.

United States Frumentum Company has increased its capital stock from $60,000 to $80,000.

Engineering Products Company has been incorporated with a capital stock of $20,000.

The Packard Motor Car Company is planning extensive plant additions to accommodate its immense business for 1912. Work is being rushed on new buildings which will triple the capacity of the Packard truck shops, a second story is being built on the service plant and a 50-ft. addition is being made to the foundry. The company is reported to have $14,000,000 worth of orders on hand for next season, and is operating night and day.

Directors of the Michigan Adjustable Hub Company, Bay City, Mich., have elected John Walsh president and H. C. Moulthrop secretary and treasurer. The company has a site arranged for and preliminary work of erecting a large plant will begin at once.

The Union Garage Company, Adrian, Mich., has just been organized by Adrian business men, to be conducted under the management of C. S. Keating. The Russ Building is being remodeled to house the company. The garage will compare favorably with those of the larger cities and will be equipped with modern machinery and accessories preparatory to handling the highest class of work.

The Lutz & Scharmer Company, Fife Lake, Mich., is erecting a 36 x 90 ft. addition to its salting station, and the Grand Rapids & Indiana Railway is constructing suitable yards and chutes in the same town for live-stock shipments.

The plant at Milford, Mich., occupied by the Detroit-Milford Sanitary Mfg. Company and later the Michigan Auto Body Company has been sold to F. A. Black, with the Globe Furniture Company, and H. C. Whitney, secretary and treasurer of the Detroit Auto Dash Company, both of Detroit. The new firm expects to commence work at once, employing a force of 10 men, and will manufacture for the present sectional bookcases and sanitary woodwork.

Improvements in the water power of L. J. Smith's factory at Smithville, Mich., have been started. The present flume will be replaced by one of cement, and two new wheels will be installed which will furnish 500 hp. Owing to the rapidly increasing business it is reported that the factory will have to be enlarged in the near future. Present improvements will necessitate a suspension of business for about 60 days.

The Holton Company, Jackson, Mich., has been organized to conduct a general machine and foundry business with an authorized capital stock of $75,000, all of which has been subscribed and paid in.

It is reported that the Fowler & Fowler Company, Fremont, Mich., manufacturer of canvas gloves, etc., is looking for a site for the location of its factory in Big Rapids, Mich.

The Cadillac Chair Company, Cadillac, Mich., has elected the following officers: President, D. B. Kelley; vice-president, Joseph Murphy; secretary-manager, J. N. Perkins; treasurer, John P. Wilcox. Work is now under way on the foundations, and the contract for the factory building will be let in a short time.

The Wickwire Mining Company, Iron River, Mich., has been organized with the following officers; President, I. H. Wickwire, Jr.; vice-president, T. H. Wickwire, Sr.; treasurer, W. A. Wickwire; secretary and superintendent, E. C. Bowers. The new company is a subsidiary of the Wickwire Steel Company, Buffalo, N. Y., which has recently become quite largely interested in this district.

Fire destroyed the mill and dry kilns last week of the Stiles Bros. Lumber Company planing mill, Cadillac, Mich., and damaged some of the stock lumber in adjoining yards. The loss, $25,000 to $40,000, is covered by insurance. The mill will be rebuilt, equipped and operations resumed at the earliest possible date.

The Great Lakes Dock & Dredge Company expects to begin work on the cement contract for the new canal at Sault Ste. Marie as soon as equipment, which has begun to arrive, is all there. The company's two years' operations will require considerable equipment, tools, stone-crushing plants, etc., and it will probably be at least 60 days before actual operations will have begun.

The Michigan Sugar Company will shortly begin building an addition to its beet sheds at the Sebewaing, Mich., plant, putting in a number of new beet flumes and erecting a large new molasses tank.

The Board of Trade of Manistee, Mich., is negotiating with a large chemical plant, with excellent prospects of landing the industry for that city.

The Mason Motor Car Company has been organized at Flint, Mich., with a capital stock of $100,000. A factory building has already been secured and the company will do a general business in the manufacture of engines for the automobile trade. A large machinery equipment will be required.

The Richmond Cement Culvert Company, which operates plants at Richmond and Caro, is making arrangements to operate a third plant at Howell, Mich.

The Walsh Mfg. Company, Frederick, Mich., is rebuilding its new mill recently burned. A band mill is to be added and the plant will be improved in many ways over the old one.

The Auto Body & Specialty Company, Flint, Mich., by the addition of a two-story building 42 x 82 ft., just completed, has increased its capacity sixfold. The company has begun operating the factory at its capacity, employing about 60 men.

An entire reorganization of the official force of the Rodgers Iron Mfg. Company, Muskegon, has occurred. P. P. Schnorbach is now president and L. E. Schnorbach is vice-president. The plant is being overhauled.

The South

LOUISVILLE, KY., August 15, 1911.

Business continues satisfactory, considering the midsummer season, and in spite of the fact that intensely hot weather has tended to reduce activity in many directions. The condition of the cotton crop remains excellent, and prospects based on a large output are therefore being maintained. Refrigerating machinery continues to hold first place in the matter of inquiries, while boilers and other power equipment are in good demand. Electrical machinery is also selling well.

The Henry Vogt Machine Company, Louisville, is

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in the market for a boiler plate roll. It must be capable of taking a ¾-in. plate. The contract for its installation will be let as soon as bids can be secured.

The Globe Machine Company, Louisville, which was recently incorporated with $5,000 capital stock, has elected Andrew B. Jutt president and general manager. The company is now making a specialty of the construction of elevators and distillery outfits.

The Kosmos Portland Cement Company, Kosmosdale, Ky., which has general offices in Louisville, has recently completed the installation of a conveyer system for handling raw and finished material. The company is contemplating the addition of equipment for enlarging the capacity of the plant.

The Culley Cement Block Company, Louisville, is considering the purchase of two additional concrete mixers to be used in the manufacture of concrete block.

The Norman Lumber Company, Louisville, which recently increased its capital stock to $75,000, is contemplating the installation of a planing mill. The machinery will probably be electrically operated.

The City Council of Owensboro, Ky., is contemplating the enlargement of the municipal lighting plant. The business of the concern has greatly increased during the past few years, it is reported, and a good deal of new equipment is urgently needed.

The Burley Tobacco Society, which has its headquarters at Lexington, Ky., is working out plans for the establishment of a factory for the manufacture of tobacco products. The society proposes to incorporate a separate company with $2,000,000 capital stock.

The Ames Auto Company, Owensboro, Ky., plans the establishment of a garage and repair shop at Lexington, Ky. J. W. Carter and W. C. G. Hobbs will be in charge.

The Modern Machine & Vulcanizing Company, Henderson, Ky., has been incorporated with $8,000 capital stock. Ike Loeb, Albert Keifer and J. H. Gillespie are the incorporators.

Jackson, Ga., is considering the issue of $5,000 of bonds for the purpose of making improvements in the water and electric light systems.

Lawrenceville, Ga., is planning to issue bonds to the amount of $35,000 for the construction of a system of water works. The J. B. McCrary Company, Atlanta, is the engineer.

The Phoenix Hotel, Lexington, Ky., which is erecting a large addition to its building, is contemplating the installation of a refrigerating plant. C. E. Richards, Columbus, Ohio, is architect of the hotel.

The Neuhoff Abattoir Company, Nashville, Tenn., will rebuild part of its plant which was recently destroyed by fire. The company has just completed the erection of an ice plant.

The Etowah Water & Light Company, Etowah, Tenn., will build a hydro-electric power plant. W. H. Price is general manager of the company, which will probably build the concrete dam itself, and is in the market for the necessary equipment.

The Auto Electric Company, Chattanooga, Tenn., has been incorporated with $25,000 capital stock by W. B. Royster, A. C. Carroll and others for the manufacture of electric machinery and appliances. Machinery is now being installed in a building which has been secured at 722 Chestnut street.

A. J. Gahagan, Chattanooga, Tenn., is organizing a company to erect a furniture manufacturing plant which will take the place of the furniture factory of the Loomis & Hart Mfg. Company, which was recently destroyed by fire.

An 85-ft. electric turntable is to be installed in the shops of the Atlantic Coast Line Railway, at West Montgomery, Ala., it is reported. F. B. Pleasants is chief engineer of the company.

The Helena Electric & Gas Company, Helena, Ark., has let a contract for the erection of a power-house and will require a lot of power equipment, including boilers, turbines, rotaries, etc. The expenditures involved will approximate $200,000.

Martin Shalliday has been appointed receiver for Harry S. Bosler, who has the contract for the erection of the pumping station of the City of Chattanooga, Tenn., and is pushing the installation of the electrical machinery which has been ordered.

Edwards & Co., Cincinnati, Ohio, will, it is reported, erect a clay-working plant for the manufacture of turpentine cups at Daisy, Tenn., near Chattanooga. The cost of the plant will be about $10,000.

The plant of the Converse Bridge Company, Chattanooga, Tenn., was destroyed by fire with a loss of $25,000. The plant, it is announced, will be rebuilt at once.

St. Louis

ST. LOUIS, MO., August 12, 1911.

There is a fair movement of machine tools in small orders, as has been the case for the past six months or more, but there is nothing in the business which could be called large, nor are there any inquiries in the market of especial consequence. Dealers are hopeful of better conditions soon, but have little on which to base their hopes.

The American Car & Foundry Company announces that there is nothing of immediate prospect in the purchase of 200 acres for a plant site at Gary, Ind. It states that while there are plans prepared for a $10,000,000 plant, there will be nothing done for a year at least, and perhaps not then, unless the business situation warrants it. The present capacity of the company is just now more than equal to the demands upon it.

The Joliet Rolling Mill Company, Joliet, Ill., has increased its capital stock from $150,000 to $250,000 for the purpose of increasing its plant.

The Byrnes Belting Company, which recently planned an increase of capacity, has taken out a permit for a $40,000 building to house the additional equipment.

The Jennings Amos Mfg. Company has leased a new building which will enable the doubling of the plant equipment of the company.

The Winter Bros. Engraving Company has leased new quarters which will enable the increase of their mechanical capacity by about 50 per cent.

The Newburg Tripoli Company has purchased a site in St. Louis and will construct a plant at once for the treatment of the tripoli ore mined in Phelps County, Mo. The plant will involve equipment costing about $25,000.

The Nixdorff-Krein Mfg. Company, manufacturer of chains, etc., and employing about 200 men, will build a new plant on the western edge of the city and will install new equipment to increase its capacity.

The Armstrong-Bell Mfg. Company, Kansas City, Mo., with $100,000 capital stock, has been incorporated by J. S. Armstrong, E. Armstrong and W. J. Bell.

The Hanna Mfg. Company, Oskaloosa, Iowa, has optioned a site in St. Louis and will remove here, enlarging its equipment and capacity.

E. J. King, City Clerk, Shelbina, Mo., will receive proposals until August 25 covering the furnishing and erection of a steel tower, 100 ft., and tank of 70,000-gal. capacity.

The David & Weber Counties Canal Company, First National Bank Building, Ogden City, Utah, is inviting tenders covering complete building and installation of machinery for a hydro-electric power plant at Riverdale, Utah.

The Scoffield Engineering Company, Little Rock, Ark., has let the contract for the construction of a new power house, where it will install new power plant and lighting machinery.

Plans are being prepared by Chas. S. Sturtevant, engineer for the erection of a new municipal electric lighting plant, at Curtis, Neb.

The Pacific Coast

PORTLAND, ORE., August 11, 1911.

A fair volume of business is coming out in metal working tools, but with very few exceptions individual purchases are of little importance, the larger shops, as a rule, keeping out of the market. Large orders have not been especially numerous since the first of the month, but buying has been quite general in many lines, and a number of important inquiries are reported. Sawmill and woodworking machinery, usually among the most important items in this territory, is in especially active demand at present. Lumbermen are complaining of low prices, but the demand is increasing, and many mills are increasing their capacity and replacing old equipment with machines of modern design. A number of mills are also putting in new power equipment. Some of the most important inquiries recently received have been for electrical machinery, and extensive development in this line is expected during the coming year. Contractors' supplies are in very fair demand, and there is a steady movement of pumping machinery, both for waterworks and irrigation. Marine

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work at ports of Oregon and Washington is keeping well up to the recent average and gas engines for small boats are in strong demand.

The Pacific Brake Shoe Company has been incorporated at Seattle, Wash., with a capital stock of $50,000, by F. Moore, C. Kucher and A. J. Tannant.

Bids will be received at this city September 6 by Major J. J. Morrow, Government engineer, for the construction of a steel sea-going dredge with suction equipment to be used on Coos Bay. The estimated cost is $350,000. Plans will be drawn shortly for two additional steel dredges for the use of the Government engineers at this port.

The Moran Company, Seattle, Wash., has taken a contract for the construction of two submarine torpedo boats for the government of Chile, the work amounting to about $1,000,000. The company has about completed work on two destroyers for the United States.

The Chicago, Milwaukee & Puget Sound Railway Company has purchased land at St. Maries, Idaho, upon which it expects to erect a new round house and machine shop.

The machine shops and round house to be built by the Northern Pacific and Great Northern railroads at Centralia, Wash., are to be begun within 90 days. Round house is to be large enough to accommodate 80 locomotives.

The Portland office of the Meese & Gottfried Company, dealers in power transmission equipment, reports a heavy demand for the last month from lumber interests throughout the Columbia River district.

The Willamette Iron & Steel Works, this city, has taken an order for traction equipment to be used by the Yosemite Lumber Company at Merced Falls, Cal. The company has placed its order for general mill equipment, including two large band saws, and has ordered a machine shop outfit from San Francisco. The order for the power plant is still to be placed. A turbine generator is being considered.

Foss & Co., who are preparing to operate the Ninemire mill at Montesano, Wash., are installing a lot of new mill equipment, including an automatic lumber stacker.

A project has been started for the installation of a gas plant at Klamath Falls, Ore.

Vincent & Grosline, Sherwood, Ore., are preparing to rebuild their sawmill.

D. W. Dorrance and others are planning to build a sawmill and box factory at Medford, Ore.

The Pacific Power & Light Company expects to start work shortly on a large new power development project at Priest Rapids, on the Columbia River.

The Idaho Glazed Cement Pipe Company has purchased a site for a new factory at Baker City, Ore.

The Wasco Warehouse & Milling Company, whose mill at The Dalles, Ore., was burned recently, is having plans drawn for a new and larger plant.

The Central Door & Lumber Company has purchased a site for a new plant adjoining the Southern Pacific shops in this city.

Machinery specifications are being prepared for a concentrator and tramway at the Utica mine near Kelso, Wash.

The local plant of the Diamond Brick Company has been purchased by the Denny-Renton Clay Company interests of Seattle, Wash., and will be greatly enlarged.

The Dils-Miller Key-seated Self-locking Nut Company has been incorporated at Tacoma, Wash., with a capital stock of $1,000,000, by L. A. Dils, Allen Miller and W. Miller. The company proposes to manufacture metal furniture.

Texas

AUSTIN, TEX., August 12, 1911.

Preparations are being made in the semi-arid portions of Texas and in many localities of Arizona and New Mexico for the installation of large irrigation plants. Many of these projects will be consummated this fall and dealers of irrigation machinery anticipate an unusually good trade in that line. Business conditions over the state and through the Southwest remain very satisfactory.

The Denton Cotton Oil & Gin Company is remodeling its round bale gin at Denton, which it recently purchased from the Planters' Compress Company.

W. C. Grant and associates will erect a factory at Abilene for the manufacture of a maize header machine.

The Bellville Cotton Oil Company has been formed at Bellville with a capital stock of $30,000. The incorporators are A. Brugger, Sr., C. F. Hellmuth and A. A. Sander.

The Middle Texas Oil Company has just purchased from J. D. Sugg the cotton-seed oil mills at Bartlett, Granger and Belton for a total consideration of $227,131 and will install new machinery and make other improvements.

Rasmussen Bros. have overcome the objections to the proposed fertilizing plant that they are to erect in North Dallas and the construction work will soon be started.

The People's Water Company has been formed at Celeste with a capital stock of $6,000. The incorporators are D. R. Buchanan, H. E. Jones and G. D. Henslee.

The Gunter Water Supply Company has been organized at Gunter with a capital stock of $5,175. The incorporators are J. D. Bowen, H. J. Barnes and J. S. Yowell.

The International & Great Northern Railroad is erecting new car buildings and repair sheds at Taylor. Five iron-working machines for car repairing work will be installed.

The Missouri, Kansas & Texas Railway Company will soon begin the erection of large shops at Greenville. A. M. Acheson, chief engineer, is seeking a site for the proposed shops. It is announced that construction will be started as soon as one is found.

H. E. Luck and assocates are arranging to establish a factory for the manufacture of automobiles at Cleburne.

The El Paso & Southwestern Railroad, which is to be extended to Tucson, Ariz., has acquired a site for machine shops, roundhouse and other features of its proposed terminals. The yards will cover 15 acres.

The Kansas City, Mexico & Orient Railroad will install machine shops at Alpine.

W. B. Walker & Sons will enlarge their canning factory at Austin.

H. H. Taylor is installing extensive machine and repair shops at Austin.

Simon Philp is installing a new cotton gin at Chriesman.

The Business Men's Club of Orange is promoting the establishment of a furniture factory.

Dr. F. L. White, superintendent of the Southwestern Insane Asylum at San Antonio, will install a canning factory to be run in connection with that institution. He will also install an irrigation pumping plant.

Jose Vasconcelos, of Mexico City, representing a syndicate of Americans, has applied to the city council of Oaxaca, Mexico, for a franchise to install an electric light and power plant in the latter city. It is the announced purpose of the syndicate to construct transmission lines to many of the towns and mining camps of the state and provide them and various industries with electrical energy.

The Fleming-Morton Company, Kirbyville, contemplates the installation of new electric light machinery.

Eastern Canada

TORONTO, ONT., August 12, 1911.

On this side of the line there are no indications of the slowing down of industry that is more than perceptible in several departments of production in the United States. Reciprocity is the issue in the current campaign, but it does not affect the manufacturing industries in any appreciable degree. At all events the manufacturing industries of Canada are now, almost without exception, in a highly flourishing state, and they are looking forward to much greater activity when the proceeds of the splendid harvest the country is reaping begin to be expended. But Canadian manufacturers, active though they are, and continuously busy up to their full capacity as they have fair promise of being, will by no means have all the home market to themselves. The competition from the United States grows keener, and Great Britain is steadily getting more of a grip on the Canadian market. Canada is just now importing, very largely from the United States, what may be called manufactured material, as forms of merchant steel, tubes, etc., to be utilized in the making of implements, machinery and articles of plant equipment. It is in the development of the upper layers of manufacturing industry that Canada is showing its greatest factory expansion.

The Otis-Fensom Elevator Company is the latest company to announce that it will erect a large addi-

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tion in Hamilton, Ont. It will add a building 60 x 200 ft.

The Standard Sanitary Mfg. Company, Toronto, has taken out a permit for the building of another factory alongside the plant it is now operating.

The E. B. Eddy Company, Hull, is building a warehouse near its works, the cost to be $50,000.

The rate payers of Cornwall, Ont., have voted in favor of raising $30,000 to be applied in water main construction.

Work is in progress for adding largely to the engine house of the Dominion Department of Public Works at Stellarton, N. S. A new boiler and other equipment is to be added to the machine shop.

The Standard Underground Cable Company, Hamilton, Ont., is building a large carpenter's shop in connection with its plant and woodworking machinery is required therefor.

The Nova Scotia Carriage & Motor factory, Kentville, N. S., is building a large extension to its works.

The McGlashan, Clark Company, Niagara Falls, Ont., has its addition to factory nearly ready for the installation of the machinery. It requires a punch press, rolls, etc., and suitable machinery for spoons and cutlery.

The Brown Smith Turning Company of Broadbent, Ont., has obtained premises for a planing mill in Parry Sound, Ont., and is installing machinery.

Plans are prepared and tenders called for for the depot of the Algoma Central Railway at Sault Ste. Marie.

There has been a conference of representatives of the City of St. John and of the Province of New Brunswick to consider the advisability of making a bid for the shipbuilding plant that is to construct the Canadian naval vessels, and in view of the fact that Halifax and the Nova Scotia government are willing to contribute $400,000, and Sydney has $300,000 available, it is considered certain that $500,000 will be offered by St. John and the New Brunswick government.

The Canada Carriage Company, Brockville, Ont., is erecting an additional factory.

The Town of Middleton, N. S., wants equipment amounting to about $15,000 or $20,000 for an electric lighting system.

J. Robinson & Sons, Niagara Falls, Ont., want a lathe drill press, a sharper electric rectifier, motor shafting, pulleys, etc.

J. Grant Henderson, Commissioner of Industries, Hamilton, Ont., announces that he has concluded arrangements with the Schacht Motor Company, an offshoot of a Cincinnati concern, to locate works in Hamilton. The officers of the company are: President, Thos. P. Rolph, Toronto; vice-president, T. H. Schacht, Cincinnati; treasurer, Gerrard Muntz, Toronto; secretary and sales manager, J. S. Innes, Toronto.

The Manufacturers' Paper Company is now looking over the ground in Canada with a view to establishing manufacturing plants on this side of the line. The Canadian manufacturers will largely increase their purchases of pulpwood from private holders of pulpwood lands in Ontario, Quebec and New Brunswick, with a view to enabling them to export free of duty into the United States the paper manufactured therefrom.

The Dominion Sugar Company, which has factories at Wallaceburg and Berlin, Ont., is preparing to build one of 10,000-ton capacity at Chatham, Ont.

The Northern Ontario Light & Power Company, whose plant was destroyed in the brush fire that swept away South Porcupine, Ont., is rebuilding and putting in a lot of new machinery and equipment, and it is preparing to give a service to all the places about Porcupine Lake.

The North American Smelter Company, Kingston, Ont., has let the contract for the erection of a manufacturing building to cost $40,000.

Western Canada

WINNIPEG, MAN., August 12, 1911.

The view taken in the West as to the elections on September 21 is that, however they go, they will have no effect to retard progress there. If the Laurier government is sustained and the reciprocity agreement is thus approved the agreement will be ratified without delay. If, on the other hand, the government is defeated, the agreement will not again be submitted to Parliament, and consequently will not come into effect. In either event, settlers will continue to flow into Western Canada both from the other side of the border line and from the other side of the Atlantic, and capital from abroad will continue to drift to Canadian undertakings. The Canadian West will go on expanding against any political conditions that it is likely to experience.

J. A. Kilpatrick, general manager of the Canada Iron Corporation at Fort William, Ont., and F. W. King, formerly general manager of the Michigan Stove Company, Detroit, and more recently of the McClary Mfg. Company, London, Ont., are in treaty with the municipal corporation of Fort William and with W. J. Copp, Son & Co. for the taking over of the stove works of the last-named, and for obtaining concessions from the city, in consideration of which that plant would be very greatly increased in capacity.

The city of Vancouver is about to spend $50,000 in the purchase of electric light standards.

It is expected that the Ocean Falls Company will begin the manufacture of pulp and paper at its new $2,000,000 plant at Ocean Falls, B. C., in about three months. About one-half the equipment of the company's machine shop, mechanical pulp mill, hydro-electric power plant, planing mill and export sawmill is already installed. The head office of the company is in Vancouver and its directors are prominent capitalists.

The Burrard Grain Company, Daysland, Alberta, contemplates the installation of flour mill machinery in connection with its elevator plant there.

The rate payers of Namaino, B. C., have granted a franchise to Haffner & Smith, Montreal, to provide hydraulic power for all purposes within city limits.

It is stated that the Canadian Pacific Railway Company has practically decided upon Calgary for the location of its Western shops.

It is stated that the British Canadian Lumber Company, Vancouver, B. C., will itself build its projected $400,000 mill on Lulu Island, but will take tenders on separate contract and machinery.

Plans have been prepared for an eight-story building in Victoria, B. C., for the Norton Griffiths Steel Construction Company.

The Canadian Fairbanks Company is erecting a $100,000 warehouse in Winnipeg and a $56,000 warehouse in Saskatoon, Sask.

New negotiations have been opened by the City Council of Edmonton, Alberta, for the construction of a great municipal power plant. Another company backed by an English syndicate is seeking the water rights at Grand Rapids, north of the city.

The City of Portage la Prairie, Man., has agreed to buy the plant of the General Electric Company there.

On August 24 the following by-laws will be submitted to the rate payers of Saskatoon, Sask., to raise $80,000 for erection of power house and purchase of site; $135,000 for purchase of machinery for new electric light and power plant.

Ely Bros., manufacturers of guns, rifles, cartridges and fire arms generally in Britain, are reported to have decided upon the establishment of branch works at Transcona, near Winnipeg. A site of 40 acres has been purchased there for the firm and men are at work upon the site.

The Alberta Linseed Oil Company is erecting a plant at Medicine Hat, Alberta. Machinery has been ordered in Toronto, in Ohio, and in England. The output is to be 1,400 gal. per day.

The Dominion Government will put in a lock at Lacolle Falls, on the Saskatchewan River, to cost $350,000. This will be of great advantage to Prince Albert, Sask., which is developing power there. It is stated that when the power is ready a New York company will utilize a large part of it in the operation of great pulp mills it proposes to establish there.

Government Purchases

WASHINGTON, D. C., August 14, 1911.

Paymaster General, Navy Department, Washington, will open bids August 29 under schedule 3820 for one No. 2 automatic screw machine complete and two new model automatic turret machines.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids September 5 under schedule 3803 for one motor-driven extension base, one motor-driven back gear power feed drill press, one motor-driven two-wheel emery grinder with two spare wheels, one motor-driven sensitive drill, one screw-cutting back-geared, motor-driven tool room lathe, one back-geared, motor-driven extension gap lathe and one arbor press for delivery to Mare Island navy yard.

The Supervising Architect, Treasury Department, Washington, will open bids until September 15 for the mechanical equipment, elevators, mail-handling apparatus, heating and ventilating systems for the United States post office, Washington.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 8 for material and supplies for the navy yards as follows:

Schedule 3749, class 1, two saddles for multiple drilling machine. Bidder 90, Manning, Maxwell & Moore, New York, $1,110.40; 99, Niles-Bement-Pond Company, New York, $2,100.

Judicial Decisions of Interest to Manufacturers

ABSTRACT BY A. L. H. STREET

Delay in Performing Contract Waived.—Where delay in performing a contract to install a heating plant was caused by both parties and the work was continued after expiration of the agreed time for completion, without objection by the owner until it was almost completed, the time limit is waived. (United States Circuit Court of Appeals, Second Circuit, Buffalo Forge Company vs. N. P. Pratt Laboratory, 184 Federal Reporter 287.)

Rights of Purchaser of Good Will of Business.—One is entitled to protection of the good will of a business purchased by him though he does not continue in business at the old location. Neither is it essential that he purchase all the assets of the old concern. (United States Circuit Court, Southern District of New York; S. F. Myers Company vs. Tuttle, 183 Federal Reporter, 235.)

Right to Interest on Payments on a Note Before Maturity.—One who makes payments on his note before they are payable according to the terms of the note is not entitled to interest on them from the date they are made to the date when they were due, unless there is an agreement to that effect. (Georgia Court of Appeals, Blackshear Mfg. Company vs. Stone, 70 Southeastern Reporter, 29.)

Rights Under Warranty of Thing Sold.—A custom in trade cannot be shown for the purpose of limiting the effect of an express warranty of a thing sold. A buyer has the right to rely upon a warranty of the quality of an article notwithstanding the fact that he had an opportunity to inspect it before accepting delivery. (Indiana Appellate Court, Hitz vs. Warner, 93 Northeastern Reporter, 1005.)

Validity of Conditional Sale Contract as Against Third Persons.—A sale of machinery on condition that title is to remain in the seller until the price is paid is valid against a purchaser of the buyer's property and against a prior mortgage, where the machinery is held in place by bolts and is removable without injury to the real estate. (Pennsylvania Supreme Court, Wickes Brothers vs. Island Park Association, 78 Atlantic Reporter, 934.)

Rights of Buyer on Breach of Warranty.—If a contract of sale has been completed the buyer cannot rescind it and return the things bought for breach of warranty unless they are worthless. But if the transaction is not complete he can return the articles and recover the purchase price. (New York Supreme Court, Niagara County; Isaacs vs. Wanamaker. 127 New York Supplement, 346.)

Right to Recover Special Damages for Breach of Contract to Sell.—Special damages resulting from breach of a contract to sell articles on account of the buyer being prevented from using the articles for a special purpose are recoverable only when they were contemplated by the parties when the contract was made. (New York Supreme Court, Appellate Term; Collins vs. A. Luban Company, 127 New York Supplement, 461.)

Contracts Violating State Anti-Trust Laws.—That goods sold and to be sold under a contract in restraint of competition were shipped from another State does not make the contract an interstate transaction so as to exempt it from operation of the State anti-trust law, where the goods became a part of a stock in the State. (Texas Court of Civil Appeals, State vs. Racine-Sattley Company, 134 Southwestern Reporter, 400.)

Right to Rescind Contract for Misrepresentation.—One induced to enter a contract through fraud is entitled to elect to acquiesce in the contract or to avoid it, but when he discovers the fraud and remains silent under circumstances tending to show acquiescence, or if he acts under the contract in such way as to indicate willingness to stand by it, he ratifies it and cannot afterward avoid it. (Maryland Court of Appeals, Latrobe vs. Dietrich, 78 Atlantic Reporter, 983.)

Trade Publications

Pumps.—Weber Subterranean Pump Company, 90 West street, New York City. Pamphlet. Size, 6 x 9 in.; pages, 8. Points out the advantages of using the Weber subterranean pump for supplying suburban residences and estates, hotels, factories and mills with water as well as draining mines and quarries. One of the special features claimed for this pump is the small number of simple parts entering into its construction, only three moving parts being employed. A complete installation consists of a pump, a motor, an air compressor, an air receiver and the necessary pipe and fittings. The pump can be directly connected with the prime mover, which is either an electric motor or a gasoline engine or a belt, a chain or a set of gears can be employed to transmit the power if desired.

Side Crank Engine.—A. L. Ide & Sons, Springfield, Ill. Bulletin No. 17. Refers to the Ideal engine and describes its construction with numerous illustrations.

Autogenous Welding Equipments.—Linde Air Products Company, 155 Chandler street, Buffalo, N. Y. Booklet No. 184. Size, 6 x 8¼ in.; pages, 49. Covers a line of autogenous welding supplies which includes generators, gauges, line and blowpipe regulators and back pressure valves. A brief description of the autogenous welding system is given, together with instructions for using the blowpipe, notes on the practical operation of the system and notes on welding. Space is given to a number of repairs made by this process, all of which are illustrated. These include ornamental iron work, locomotive parts, a large transformer case and a number of pipe fittings where the flanges were built up and broken parts welded on.

Globe Valves.—Chicago Mfg. Company, Chicago, Ohio. Pamphlet. Concerned with the Lippy valve for use on steam, water, air and gas lines. The special features claimed for this valve are absolute freedom from scale cutting and kindred evils and ability to pack the valve under pressure with no inconvenience. These valves are made with screwed or flanged ends in seven sizes ranging from ¼ to 3 in.

Transformers, Condensers, Ore Breaker and Engines.—Allis-Chalmers Company, Milwaukee, Wis. Three bulletins and two instruction leaflets. The first, No. 1076, superseding No. 1047, is concerned with the Allis-Chalmers power transformers which are built in three types for self, water and air blast cooling. A general description of the construction of the transformers supplemented by half tone and line engravings is given, followed by a discussion of the electrical characteristics illustrated with curves. A discussion of the conditions governing the choice of a transformer is included, together with information regarding the relative fire risk of the oil and the air blast types. Bulletin No. 1071 refers to the type C jet condenser which, it is claimed, is the only type of jet condenser in which vacuum can be formed or recovered with full load on the engine or turbine without a stop valve in the main exhaust pipe or an auxiliary forced injection. The construction, operation and efficiency of this condenser are discussed at length and the text is supplemented by line engravings. Bulletin No. 1448, superseding No. 1416, contains a detailed description of the construction of the style K Gates rock and ore breaker supplemented by illustrations. Instruction leaflets No. 2004A and 2004B, both of which are reprints, give directions for setting the valves of the Allis-Chalmers 1890 and Girder Frame and the Allis-Chalmers Heavy Duty and Reliance Corliss engines respectively.

Sipe's Japan Oil.—James B. Sipe & Co., North Side, Pittsburgh, Pa. Pamphlet, 6 x 9 in., 20 pages. Contains facsimile letters from users of Sipe's Japan oil, etc., the letters coming from various sections of the United States, New Zealand, Australia, etc. Gives practical information to users and buyers of paint supplies who desire to be informed on securing best results in painting.

The Excelsior Carburetor.—Excelsior Needle Company, Torrington, Conn. Pamphlet; 24 pages; illustrated. Describes a carburetor which is automatic in action. Contains exceptionally interesting information because of the great detail with which the apparatus is described, line drawings adding much to the article.

Gears.—The Boston Gear Works, Norfolk Downs, Mass. Catalogue E-4. Size, 3½ x 6 in.; pages, 80. Lists with numerous illustrations the various sizes and styles of gears which this company is prepared to furnish. These include cut iron and steel involute spur gears, steel racks with involute planed teeth, brass and steel pinion wire with machine cut teeth and finished brass spur and internal gears. Miter and bevel gears can also be supplied in steel, iron or brass, together with single or double thread steel worms and cast iron worm gears and iron and brass spiral and helical steel gears. In addition to the illustrations tables are included giving the diameter and the size of the hole bored through the center of the blank. Space is also given to sprockets and chains of various kinds, steel and bronze universal joints and ball thrust bearings. A number of tables, including ones giving the relative value of diametrical and circular pitches in terms of each other, decimal equivalents dimensions of standard keyseats and the weights of round and square steel bars complete the catalogue.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:	
1 to 1⅞ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	℔ 1.70¢
1½ to 4 in. x ¼ to 5-1	℔ 1.80¢
Rods—⅝ and 11-16 round and square.	℔ 1.80¢
Angles:	Cts. ℔ lb.
3 in. x ¼ in. and larger	1.90¢
3 in. x 3-16 in. and ⅛ in.	2.30¢
1½ to 2½ in. x ⅛ in.	2.05¢
1½ to 2½ in. x 3-16 in. and thicker	1.95¢
1 to 1¼ in. x 3-16 in.	2.05¢
1 to 1¼ x ⅛ in.	2.10¢
⅞ x ⅛ in.	2.20¢
¾ x ⅛ in.	2.25¢
⅝ in. x ⅛ in.	3.45¢
½ x 3-32 in.	3.90¢
Tees:	
1 in.	2.35¢
1¼ in.	2.20¢
1½ to 2½ x ¼ in.	2.00¢
1½ to 2½ x 3-16 in.	2.10¢
3 in. and larger	2.95¢
Beams	1.90¢
Channels, 3 in. and larger	1.90¢
Bands—1¼ to 6 x 6-16 to No. 8	2.10¢
Burden's "H. B. & S." iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

	per ℔
Bessemer machinery	1.90¢
Toe calk, tire and sleigh shoe	2.50@3.00¢
Best cast steel, base price in small lots	7¢

Sheets from Store—

Black

	One pass, soft steel.	R. G. cleaned.
No. 16	℔ 2.45¢	2.75¢
Nos. 18 to 20	℔ 2.50¢	2.85¢
Nos. 22 and 24	℔ 2.55¢	2.95¢
No. 26	℔ 2.60¢	3.05¢
No. 28	℔ 2.95¢	3.30¢

Russia, Planished &c.

Genuine Russia, according to assortment	℔ 12 @14½
Patent planished, W. Dewees Wood	℔ A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14	℔ 2.75¢
No. 24	℔ 3.10¢
No. 26	℔ 3.30¢
No. 28	℔ 3.60¢

No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	℔ 5.50¢
No. 26	℔ 6.00¢
No. 28	℔ 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24	℔ 100 sq. ft... $3.75	$4.70
No. 26	℔ 100 sq. ft... 2.85	3.90
No. 28	℔ 100 sq. ft... 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. charcoal:	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20.....107 lb.	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ℔

High Brass Rods—

List February 1, 1911. 14⅜¢ ℔

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ℔

Brass Wire—

List February 1, 1911. 14⅜¢ ℔

Copper Wire—

Base price, Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ℔ 18¢

Sheet copper cold rolled, 1¢ ℔ advance over hot rolled.

Sheet copper polished 20 in. wide and under, 1¢ ℔ square foot.

Sheet copper polished over 20 in. wide, 2¢ ℔ square foot.

Planished copper, 1¢ ℔ square foot more than polished.

METALS—

Tin—

Straits pig	℔ 46 @47 ¢

Copper—

Lake ingot	℔ 14 @14¼¢
Electrolytic	℔ 13¾@14 ¢
Casting	℔ 13¾@14 ¢

Spelter—

Western	℔ 6¾@6¾¢

Zinc—

No. 9, base, casks	℔ 8¼¢ Open.. ℔ 8¾¢

Lead—

American pig	℔ 5¼@5¾¢
Bar	℔ 6¾@6¾¢

Solder—

½ & ½, guaranteed	℔ 28¼@28¾¢
No. 1	℔ 26¼@26¾¢
Refined	℔ 24¾@25¼¢

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson	℔ @ 9¾¢
Hallets	@10 ¢
Other brands	9@ 9¼¢

Bismuth—

Per ℔ $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting	21¢ and 22¢
Rods and Wire	Base price 31¢
Sheets	Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

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Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

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